DECEMBER 1954

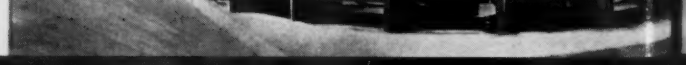
FOUNDRY

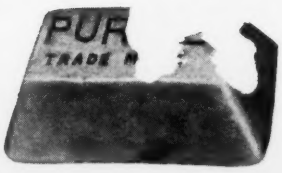
...WHEREVER METALS ARE CAST

VACUUM DEGASSING

of Nonferrous Metals—*page 78*

CONTENTS—page 3





FOR BETTER MELTING... CLEANER IRON—

PURITE

1. Purite produces higher percentages of finished castings—fewer rejects per ton of metal poured.
2. Purite gives 100% fluxing action in the cupola—100% desulphurizing action in the ladle.
3. Purite is time-tested and proved for rapid and unsurpassed desulphurizing uniformity.
4. Purite permits the use of higher-sulphur raw materials.
5. Purite is 100% pure fused soda ash—you do not pay for inert materials.
6. Purite comes in uniform 2-lb. pigs—no weighing or measuring required.
7. Purite does not crumble—is easy to handle—no waste, no dust.
8. Purite can be shipped in bulk carloads at substantial savings over bag shipments—is easily stored without deterioration.

Purite, the scientific flux, is sold by leading foundry supply houses in the United States and Canada.

OLIN MATHIESON CHEMICAL CORPORATION

MATHIESON

INDUSTRIAL CHEMICALS DIVISION

Baltimore 3, Maryland

2625

Making 'em Toe the Mark

... or how Chuck Wright keeps center line shrinkage from drifting

"How the little woman keeps everything in line would surprise you," said Chuck Wright, foundry specialist for an INCO distributor. "Especially if you knew how dirty my shirts get, pokin' around cupolas.

"In my foot-loose and fancy-free days, each new cotton shirt I sent to the laundry came back so shrunk out of shape it nearly choked my ears off.

"But after saying 'I do,' the missus took over," added Chuck, "and there's no more shrinking. She says the cotton is treated to stop the trouble.

"I was wondering whether cotton has anything in common with cast iron, when Lars Tomsen, Supt. of the Johnson & Uhl Foundry, wired to get down there fast. Johnson & Uhl, specialists in paper mill drier rolls, had poured 11 consecutive leakers.

"This was bad news, because Lars had always turned out perfect rolls . . . using 1.5% nickel. In some, he used as little as 1.25%, and in others, as high as 1.75% nickel. Chemistry of the mix, pouring temperature, pouring technique and design of the mold . . . all played a part, of course, in determining whether a casting would be dense and pressure-tight.

"But examination of the rolls showed leakers about 3 ft. from the bottom and within 7 ft. of the top. And, of course, they had to be scrapped.

"Noticing the dirt on my cotton shirt, I wondered how Lars treated his iron. A few questions brought out the fact that his mix now contained no nickel. It was a costly experience, for he lost 11 consecutive rolls . . . each of them 20′ long.

"Apparently, with iron that lacks adequate nickel content, the shrinkage is out of control and so a line of shrinkage can meander from the ID to the OD of the roll.

"After putting in the old percentages of nickel, Lars resumed successful production of drier rolls.

"Now he is surer than ever that nickel provides essential density and uniformity so that the freezing is such as to keep the shrinkage under control.

"You may not meet up with the same trouble that bothered Lars Tomsen, but if it's a casting problem, play it safe . . . just drop me a line . . . no matter how large or small your plant, I'll be glad to help you."

Chuck Wright

INCO TRADE MARK

The International Nickel Company, Inc.

67 Wall Street New York 5, N. Y.

WRITE FOR YOUR COPY

of FEDERAL'S useful **BULLETIN** on the preparation of "tailor-made" molding sands

If you have not already done so, you really should send for this bulletin, for hundreds of foundrymen have found it to be extremely helpful in the preparation of molding sands.

It explains in detail the seacoal-bentonite-stabilizer method of sand preparation. It fully describes the three additives—the properties they provide for sand mixtures—how to use them—and suggests a variety of sand mixtures for different types of castings.

An overwhelming majority of iron foundries now use this method of sand preparation. It is thoroughly dependable, produces excellent castings, does *not* require close sand control and . . . the three additives actually cost *less than $1.00 per ton of castings produced.*

Therefore, if you're using any other method of sand preparation—using other materials that cost more and require exacting sand control—then investigate this *better* method. Write for FEDERAL's Molding Sand Bulletin . . . NOW!

DUSTLESS

SEACOAL *and* PITCH BINDERS

CROWN HILL SEACOAL AND FEDERAL PITCH BINDERS now come in the new "dustless" grades as well as regular. They're chemically treated to minimize dustiness in handling. The slight additional cost is more than offset by more healthful working conditions, better "housekeeping" and the elimination of losses in air-swept mixing and handling equipment. Ask your FEDERAL representative to demonstrate the new "dustless" additives.

FEDERAL

Make your foundry a better place in which to work!

The **FEDERAL FOUNDRY SUPPLY** *Company*

4600 EAST 71st STREET, CLEVELAND 5, OHIO

CROWN HILL, W. VA. • CHICAGO • DETROIT • MILWAUKEE • RICHMOND, VA. • ST. LOUIS • CHATTANOOGA • NEW YORK • UPTON, WYO.

IN TWIN CITIES: C. D. Gallaher Company, 428 Stinson Blvd., Minneapolis

FOUNDRY

December 1954

Volume 82—Number 12

Why Take Chances? (Editorial) 77

SPECIAL ARTICLES

Vacuum Degassing of Nonferrous Metals 78
Application of vacuum degassing treatments that may be applied to practical foundry operation—By H. F. BISHOP, E. E. LAYNE and W. S. PELLINI

Eliminating Defects in Die Castings 84
Common die casting irregularities are described with an outline of steps suggested for diagnosis and remedial treatment—By W. M. HALLIDAY

Closed-Top Cupolas End Air Contamination 86
Hot blast, sealed cupolas use wet impingement-type collectors to eliminate air contamination of stack discharge—By ROBERT H. HERRMANN

Modern Methods Employed in Berliet Foundries 90
Story details operations at huge French iron and steel foundry that uses modern, mass production methods—By VINCENT DELPORT

Straight Line Flow Ends Cleaning Room Bottleneck 94
Streamlined, mechanized operation saves 27 per cent of cleaning costs for castings weighing 50 lbs or less—By ROBERT H. HERRMANN

Some Properties of Phenolic Resin Core Binders 100
Here are results of tests of some of the physical properties of dry sand cores made with thermosetting binders—By C. E. SCHUBERT

Centrifugal Casting of Sleeve Bearings 102
Author presents data on techniques, speeds, temperatures, alloys and design of centrifugal casting machines—By J. B. MOHLER

Castings Pickled in Half the Time By ROBERT H. HERRMANN 135

Trouble Shooting By C. W. AMMEN 144

Man-to-Man By RALPH L. LEE 166

International Foundry Congress By VINCENT DELPORT 170

How to Buy Foundry Equipment By E. W. FAIR 228

MEETINGS

National Foundry Association 123
FEMA Annual Meeting 126
Michigan Regional Conference 129
Investment Casting Institute 140
New England Regional Conference 158
All-Canadian Conference 202
Purdue Metals Casting Conference 238
National Metal Congress and Exhibit 240

NEWS FEATURES

Around the Country	191	**Late Foundry News**	33
Calendar of Meetings	204	**Men of Industry**	112
Foundry Group Activities	181	**News Views**	150
Industry Briefs	152	**Obituary**	143

REGULAR DEPARTMENTS

Data Sheet	199	**Questions and Answers**	106
Foundry Developments	156	**Readers' Comment**	72
How To Do It	154	**Statistics**	195
Ideas for Foundrymen	209	**Trade Publications**	252
New Equipment and Supplies	206	**With the Editors**	10

Business Staff—page 273 **Classified Advertising—page 265** **Advertisers' Index—page 273**

EDITORIAL STAFF

FRANK G. STEINEBACH
Editor

WILLIAM G. GUDE
Managing Editor

EDWIN BREMER
Metallurgical Editor

ROBERT H. HERRMANN
Associate Editor

JACK C. MISKE
Assistant Editor

KENNETH L. MOUNTAIN
Assistant Editor

BYRON E. KENNEL
Assistant Editor

VIRGINIA C. TAYLOR
Assistant Editor

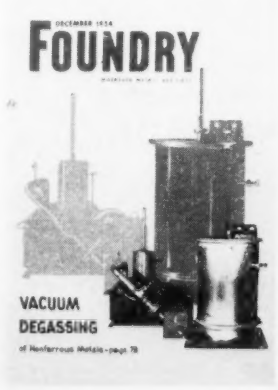
VIRGINIA B. HARMS
Assistant Editor

DON S. CADOT
Art Editor

New York ..... B. K. PRICE
L. E. BROWNE, SAMUEL W. BAKER
Detroit ..... FLOYD G. LAWRENCE
Pittsburgh ..... ROBERT M. LOVE
Chicago ..... ERLE F. ROSS
Washington ..... E. C. KREUTZBERG
London ..... VINCENT DELPORT

ADVISORY STAFF

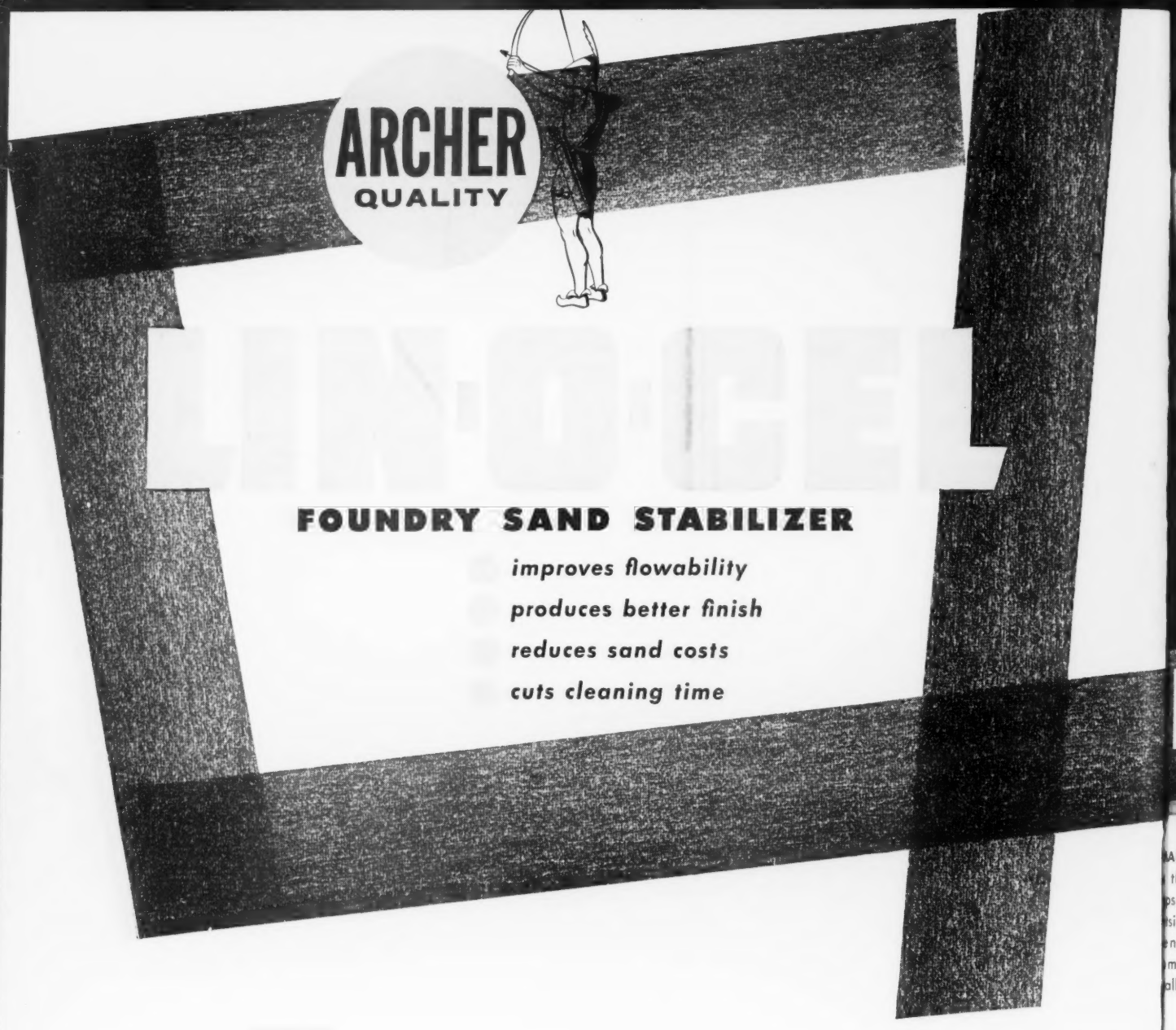
JOHN W. BOLTON
ALBERT E. GROVER
BERNARD P. MULCAHY



THE COVER: Vacuum degassing treatments that may be applied in practical foundry operation by use of mechanical pumps are described in story on page 78

Published monthly by the Penton Publishing Co., Penton Building, Cleveland 13, O. Subscriptions in the United States, possessions and Canada, one year, $5; two years, $8. Other foreign countries, one year $10. Single copies 75 cents. Copies published three or more months previous to date of current issue $1. Entered as second class matter at the post office, Cleveland, O., under the act of Mar. 3, 1879.

Copyright, 1954, by the Penton Publishing Co.



Making an important contribution to both quality and cost reduction is Archer LIN-O-CEL, a foundry sand stabilizer unexcelled in flowability and finish characteristics. LIN-O-CEL is a finely ground cellulose material which "cushions" sand expansion and eliminates stresses at the mold surface. Casting defects are thus held to a minimum.

The chart at the right is evidence of the savings which can be gained through the use of LIN-O-CEL.

We urge *you* to be skeptical. First read about LIN-O-CEL; then test a sample in your foundry. Write ADM, or use coupon at the right.

NOTE: The castings pictured are produced by the Foundry Department of the General Electric Company at the Elmira Foundries, Elmira, N. Y.

rcher • aniels • idland compar

FOUNDRY PRODUCTS DIVISION • 2191 West 110th Street • Cleveland 2, O

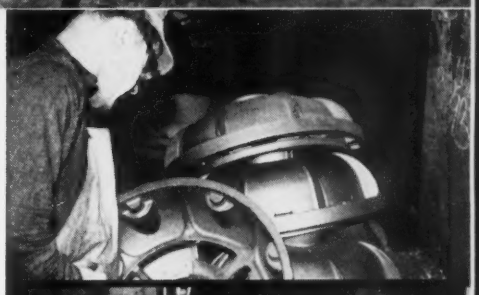
SWITCH TO THE ADM LINE OF QUALITY FOUNDRY PRODUCTS

Archer LIN-O-CEL is carefully measured by weight, then mixed into system sand.

ALL CASTINGS, such these fence post s, are furnished to side customers by neral Electric. me castings are all as 8 oz.

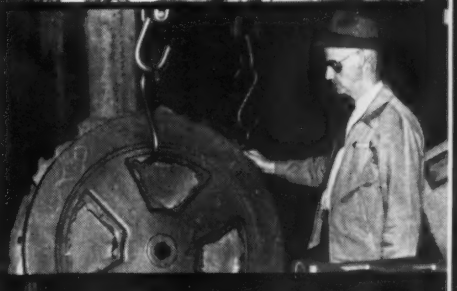
SMOOTH FINISH CASTINGS

Unretouched photographs reveal the unblemished surfaces of these bell and frame castings.

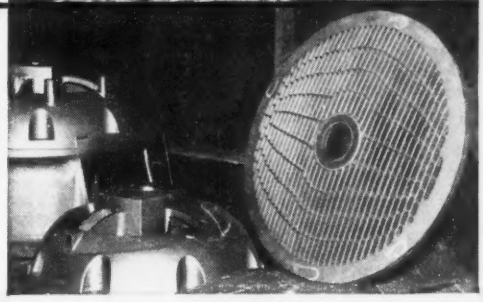


RGE CASTINGS, like huge frame gener- require less clean- when LIN-O-CEL sed.

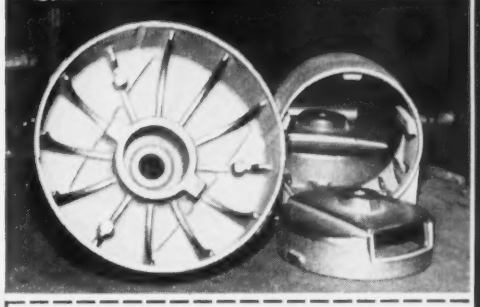
Huge end-bells require minimum chipping in the cleaning operation.



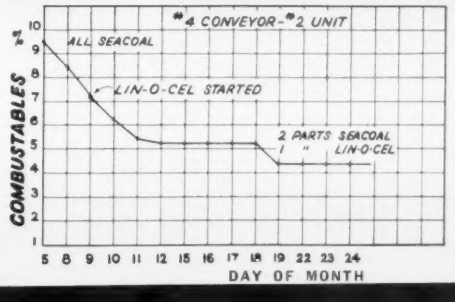
TRICATE CASTINGS, instance this grille de with LIN-O-CEL- ated sand, clean icker and look better.



Spot checking the clean, smooth, finish of a heavy casting before cleaning.



ING IN SAND COST
d 2, revealed by this art showing reduc- in combustibles in em sand through use of LIN-O-CEL.

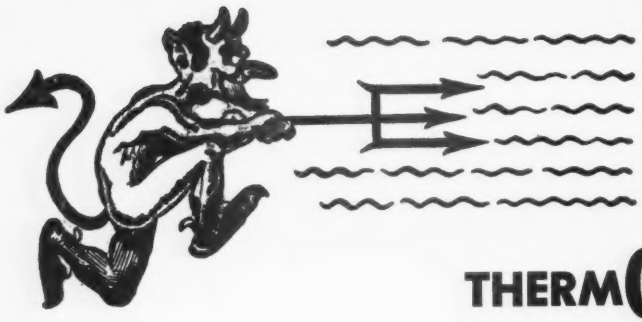


SEND FOR BULLETIN NO. 8170 TODAY!

Archer-Daniels-Midland Company
Foundry Products Division
2191 West 110th Street, Cleveland 2, Ohio

☐ Please send me copy of LIN-O-CEL Bulletin.
☐ Please have ADM Representative call.

Name .....
Title .....
Company .....
Address .....
City ..... Zone .....
State .....



Soffel's

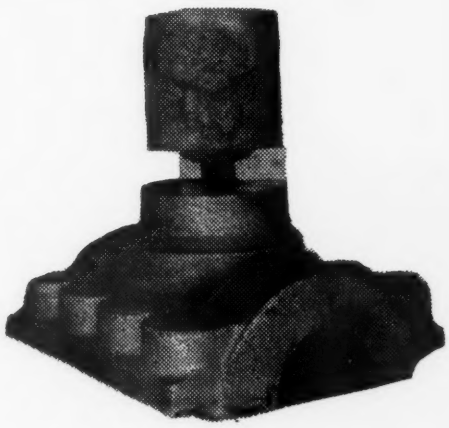
THERMOTOMIC® COMPOUNDS and CARBON FREE LIQUIDIZERS

Keeps metal molten!

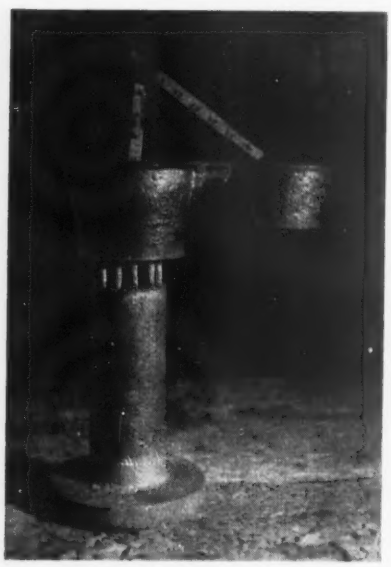
. . . for Steel, Iron, Aluminum, Brass, Bronze, Copper

THERMOTOMIC "X" is a patented exothermic compound that produces a temperature over 3500° F. It can be molded or baked into any desired shape the same as sand cores. THERMOTOMIC "X" is used as knock off core rings with 1½ inch feeder opening under risers of feeding heads, also as insulating sleeves, inserts and facings, or mixed with facing sand where it is desired to maintain fluidity of the casting metal. Shorter and more compact heads and risers can be used. The small feeder opening permits easy removal of feeding heads and risers. In conjunction with THERMOTOMIC COMPOUNDS, we recommend the use of exothermic CARBON FREE LIQUIDIZER NO. 5 on top of the metal in the heads or risers as an insulating cover. For green sand casting molds, use THERMOTOMIC WP (Waterproof).

U. S. Patents No. 2,490,327 and No. 2,500,097



300 lb. aluminum bronze bearing cap cast with THERMOTOMIC feeding ring core under riser. Note small feeder opening which facilitates removal of riser from casting, resulting in greatly reduced cleaning costs.

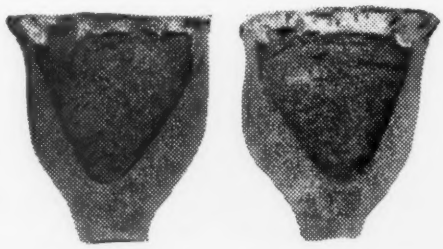


THERMOTOMIC STRAINER CORE

Produces Monel Castings 270 lbs. solid

Made by direct pouring through the Thermotomic strainer core under the feeding head.

No chills were used, no shrinkage at the flange. Note depth of shrinkage in the feeding head.



NOTE THESE TYPICAL RESULTS FROM THE USE OF SOFFEL'S CARBON FREE LIQUIDIZER

With the application of 1 pound of SOFFEL'S CARBON FREE LIQUIDIZER, this 6″ x 6″ chrome-nickel-steel riser was reduced in weight from 32 pounds to 13 pounds average. A savings of 19 pounds of salable metal, normally discarded as scrap, was fed into the casting and produced a heavier, sounder casting. Note the feeding head can be knocked off easily, saving burning costs. There is no better feeding head compound at any price than SOFFEL'S CARBON FREE LIQUIDIZER.

BEWARE OF IMITATIONS! We are the originators of CARBON FREE LIQUIDIZER and THERMOTOMIC COMPOUNDS

Pittsburgh Metals Purifying Company

WORLD'S LARGEST MANUFACTURERS OF FLUXES AND PURIFIERS FOR ALL METALS AND ALLOYS

1352 MARVISTA ST., N.S. **PITTSBURGH 12, PA.**

Two Compartment Car Type Mold Drying Oven.
Two Compartment Rack Type Core Oven.
Single Compartment Rack Type Core Oven.
LANLY
FOUNDRY OVENS
THE LANLY COMPANY • 780 PROSPECT AVE
CLEVELAND, OHIO
Four Compartment Rack Type Core Oven.
Car Type Core Oven.
Drawer Type Core Oven.
Three Compartment Rack Type Core Oven.

The Lanly reputation has been established as the result of the consistent incorporation of advanced, efficient design and high grade construction into every Lanly installation.

Core baking, pasting and mold drying ovens as well as casting conditioning and heat-treating ovens are available in standard units.

Write for Literature and Complete Information.

You asked for it!

A brand new Universal Mold Conveyor

Since foundry mechanization began, operators have sought a continuous mold conveyor that would provide smooth travel up and down inclined planes, as well as on the level.

Jeffrey foundry engineers talked with dozens of foundrymen during development of the revolutionary new Universal Mold Conveyor. They analyzed your problems, established goals, and finally came up with *the answer.*

This new Universal Mold Conveyor is years ahead of the field. It increases foundry production, cuts costs and saves maintenance . . . sets a new standard for flexible, adaptable, well-integrated mold transportation.

Jeffrey foundry engineers are ready to discuss this pacemaking system with you.

CHECK THESE ADVANCES:

NO LUBRICATION NEEDED—Equipped with sealed-for-life Ball Bearings, Oil Impregnated Bushings.

SMOOTH OPERATION—Each car has individual adjustment to match Crawl Drive.

NO SLIDING TRACK FOR TAKEUP—Internal Takeup on each car eliminates expensive foundations.

ALL MOVING PARTS SHIELDED—Full protection from sand, shot and runout.

ANY TYPE TOPS—Steel, Cast Iron, Roller Conveyor or Hinged Tops for Automatic Dump. Can be changed without interfering with conveyor.

FLEXIBLE CONTOUR—Operates in both vertical and horizontal plane. Full operation at elevations to suit each operation.

NO SLIDING WHEELS ON CURVES—Wheels always radial to curves.

RUGGED MALLEABLE IRON CHASSIS CASTINGS—Strength to spare for the toughest jobs.

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

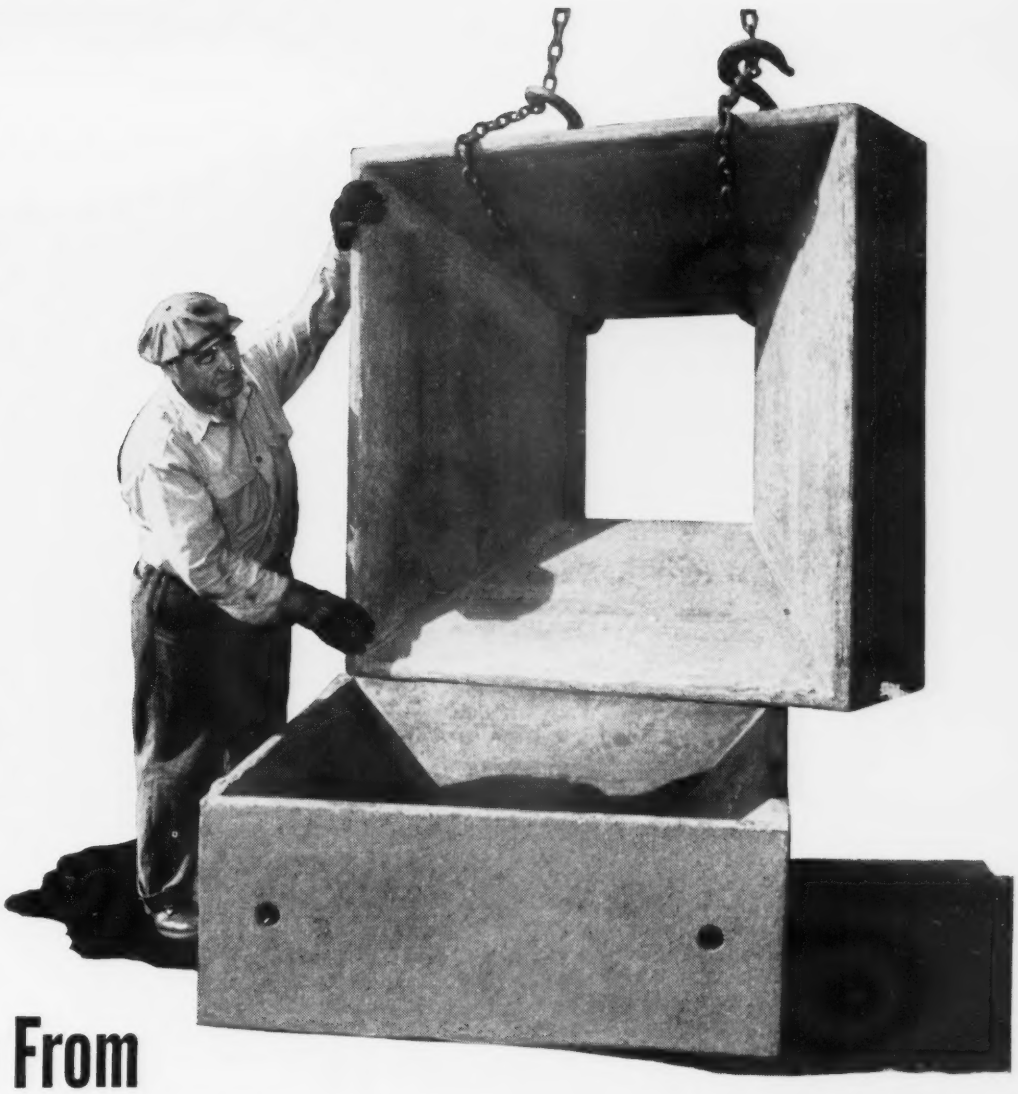
Columbus 16, Ohio

sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED

. . .IT'S A JOB FOR JEFFREY!



Chills Cast From Chateaugay Pig Iron Resist Heat at 3400°F

Casting surfaces resistant to heat and corrosion are extremely important to Dobbie Foundry & Machine Company, Niagara Falls, N. Y.

The casting illustrated is a chill or trough. It is used to direct the flow of molten chromium into molds. The casting surfaces must withstand temperatures over 3400° F.

To obtain surfaces resistant to such heat, Dobbie uses Chateaugay, Republic's exclusive premium Pig Iron, in its cupola mixture.

Resistance to heat and corrosion are only two of many benefits foundrymen enjoy with Chateaugay. It also produces an unusually fine and uniform grain structure with high wear resistance. Chateaugay castings machine beautifully and economically. Chateaugay shrinks evenly, fills adjoining light and heavy sections completely.

For the complete story on Chateaugay, the low-phosphorous, copper-free Pig Iron, call in a Republic Pig Iron Metallurgist. He has all the facts. He can show you how to obtain high strength, uniformity and machinability throughout every casting.

Just let us know when you would like him to call.

REPUBLIC STEEL CORPORATION

GENERAL OFFICES • CLEVELAND 1, OHIO

Export Department: Chrysler Building, New York 17, New York

REPUBLIC PIG IRON

"CHATEAUGAY"	REPUBLIC	REPUBLIC
Low-Phosphorous, Copper-Free	(Northern) Foundry, Bessemer Basic and Malleable	(Southern) Foundry and Basic

REPUBLIC STEEL

Secret impregnating compounds and processing make IMPERIAL BELTS outwear all others

Service records up to 10 years in foundry and similarly punishing installations are not unusual for Imperial conveying and elevating belts.

What is unusual is the way Imperial gives its belts such long-wearing, money-saving qualities. Highest-quality hard silver duck, double-stitched with inner-locking stitches to positively prevent ply separation, gives them inherent strength.

Exclusive compounds used

To this basic construction Imperia' adds something else . . . special, exclusive chemical formulations developed by Imperial and constantly improved during our 45-year experience.

Imperial Belts are impregnated with these compounds to prevent or minimize damage from cutting, gouging, crushing impact, abrasion, moisture, oil and temperatures as high as 600° F. This process also further strengthens, lubricates and preserves the fibers so that Imperial Belts outlast others as much as *four to one.*

Job-designed belting

Different compounds are used to create a dozen belts of widely varying physical characteristics. Thus, Imperial Belts are job-designed for specific operating conditions . . . they last longer, require less maintenance.

The formulae of these compounds are Imperial's secret. But it's no secret that Imperial Belts give lowest ultimate belting cost and top operating satisfaction. Why not request our free engineering assistance on your new or replacement installations?

Imperial
BELTING CO.
1755 S. Kilbourn Ave., Chicago 23, Ill.

WITH THE EDITORS

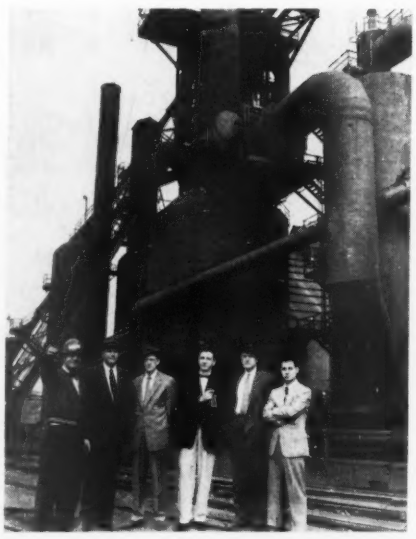
WHERE ARE WE GOING?: What are the future prospects for the foundry industry? FOUNDRY has directed this question to representatives of the ten foundry and allied groups holding membership in the National Castings Council. Replies will be presented as a feature in the January issue. You should find the ideas of these industry leaders quite interesting. This will be only one of a number of featured articles planned for next month's issue.

—o—

Castings at the Show: The recent National Metal Exposition in Chicago illustrated once more the importance of castings as components in the construction of an ever-widening field of objects. While castings produced by normal foundry practices in sand molds were shown, the majority of the 23 foundry exhibitors displayed castings produced by special methods, such as plaster molds, shell molds, investment molds, die casting and centrifugal casting. Some very fine looking intricate castings were on display.

—o—

Yes, the Editors Do Get Around: As this photograph was taken Bill Gude, managing editor (second from right), in company with a group of reporters, was being shown the equipment for control of air and stream



pollution at the new Central Furnaces and Docks of American Steel & Wire in Cleveland. C. W. Shafer, plant engineer, is doing the pointing.

—o—

Just Ask: During the past few months, producers of machines and materials used in the production of castings have introduced more new products or improvements in previously used equipment and supplies than at any time in the more than 30 years I have been an active observer of progress in foundry practice. You may have noticed that an exceptionally large amount of editorial space has been devoted in each issue to the regular section "New Equipment and Supplies." Nevertheless it is almost impossible to keep up with the procession of material on developments in equipment and supplies which reaches this office each month.

By the way, have you noticed that it is easy for you to secure more details on the equipment and supply items. You will find a special number indicated at the bottom of each equipment and supply item. Note the number of the item on which you desire further information, circle these numbers on the business reply card found in the "Ideas for Foundrymen" insert included in the equipment and supplies section, fill in your name and address and mail. No postage is required.

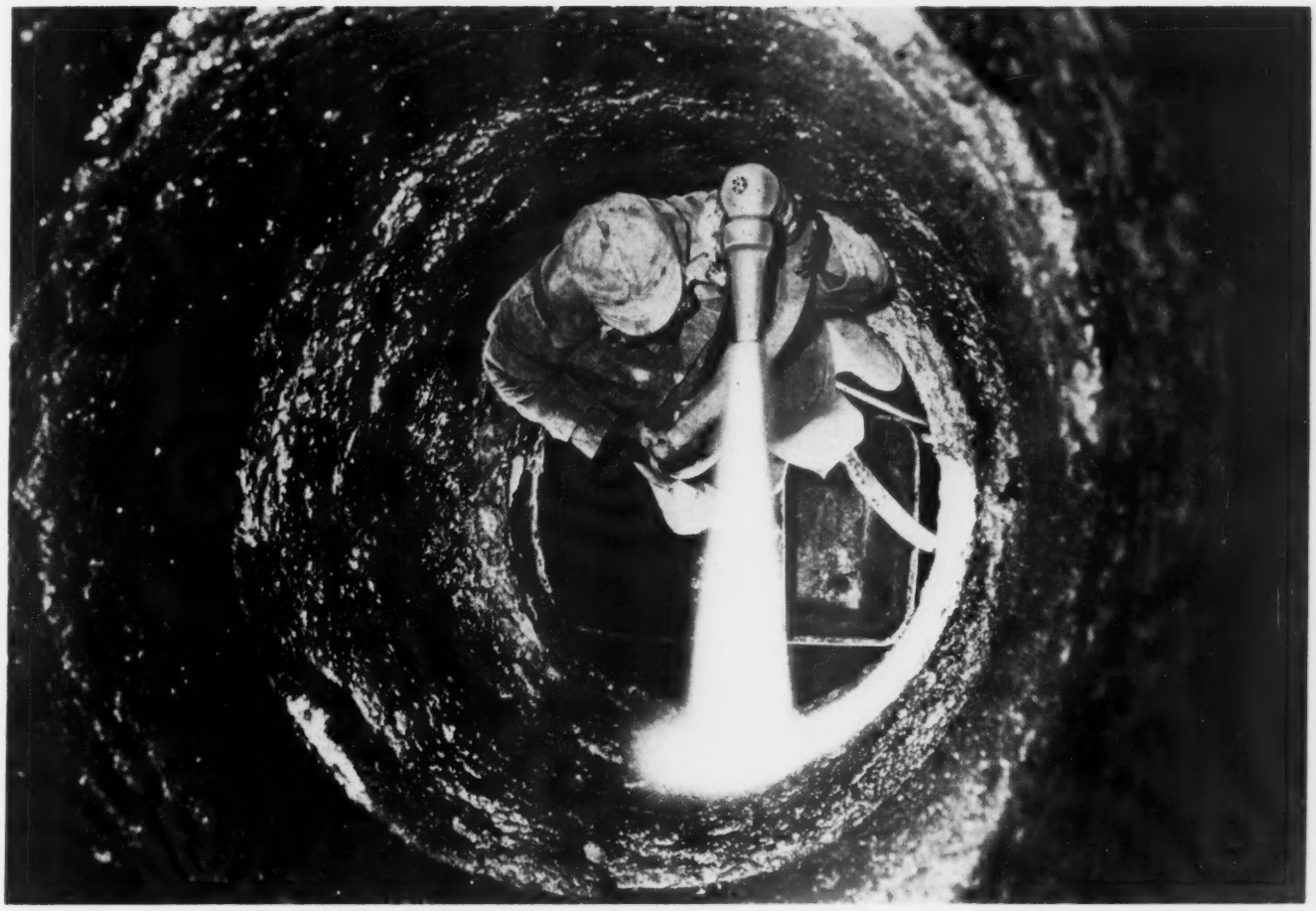
You will be surprised at the valuable information that is yours for the asking.

—o—

Reproduces Clock from Memory: Simplicity Engineering Co., Durand, Mich., is proud of the reproduction of a 156-year old Hungarian clock, located on the roof of its new screen warehouse and factory. John Sandula, retired superintendent of the company, reproduced the clock from memory, which in itself is a remarkable feat. John learned the ornamental iron trade in his native Hungary, and while there worked for a man who built and repaired clocks. John made some repairs on the cathedral clock in 1901, and remarked that after running for over 100 years, it needed a little work.

Two months were spent in drawing the plans from memory, and the job of hand tooling to close tolerances each of the 1500 parts took an additional six months. The finished clock, shown in the accompanying illustration, has the face, figures and bells mounted on the roof and is run by long shafts from the works, housed in the building. The pendulum is 8 ft 9 in. and weighs 32 lb. The clock is driven by three weights, each weighing 32 lb. It departs from its European counterpart in that the

(*Concluded on page* 12)



Gunning for savings with HARBISON-WALKER

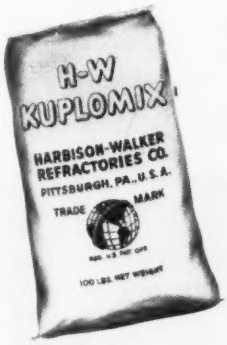
KUPLOMIX

Substantial savings in cupola maintenance are assured by the use of H-W KUPLOMIX—a modern refractory which provides joint free linings. In the foundry it is also used to good advantage for the linings of ladles and troughs.

H-W KUPLOMIX is easy to apply either by air-placement guns or by ramming. It is exceedingly resistant to the impact and abrasion of the charge, the erosive action of molten metal and slags and to the chemical attack of slags.

H-W KUPLOMIX consists of grain-sized silica quartzite of unusual purity and a highly refractory bond clay which develops a strong ceramic set at furnace temperatures.

Please write for complete information about H-W KUPLOMIX, the modern service-proved cupola refractory.



Harbison-Walker Refractories Company

AND SUBSIDIARIES

World's Largest Producer of Refractories

GENERAL OFFICES **PITTSBURGH 22, PA.**

A Modern Installation of Mathews Foundry Conveyers

however it must be handled

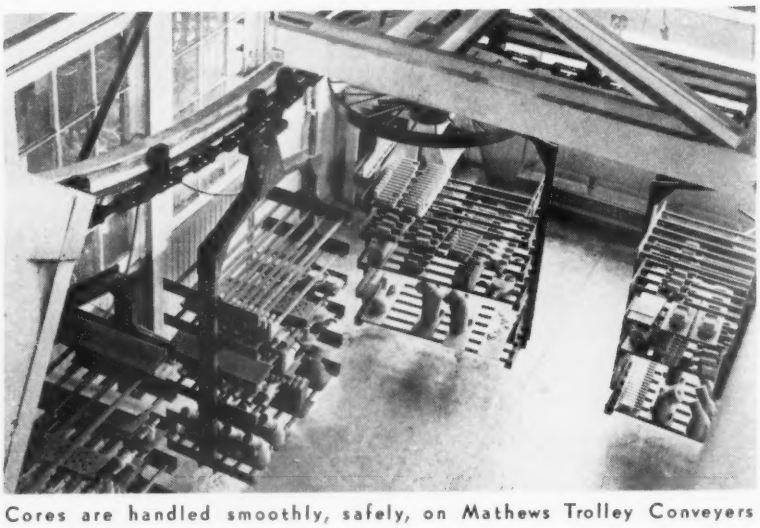
by GRAVITY

In foundries everywhere, Mathews Roller Conveyers are standard equipment. They are designed by people who know foundry conveying problems. *They are built to stay on the job.*

or POWER

Trolley, live roller, pallet and drag chain—they are all part of the complete Mathews line of power conveyers engineered for *foundry* service.

. . . there are MATHEWS CONVEYERS to do the job the way it should be done



Cores are handled smoothly, safely, on Mathews Trolley Conveyers

MATHEWS CONVEYERS

GENERAL OFFICES . . . *Mathews Conveyer Company*
ELLWOOD CITY, PENNSYLVANIA

PACIFIC COAST DIVISION . *Mathews Conveyer Company West Coast*
SAN CARLOS, CALIFORNIA

CANADIAN DIVISION . . . *Mathews Conveyer Company, Ltd.*
PORT HOPE, ONTARIO

Engineering Offices or Sales Agencies in Principal American and Canadian Cities

(*Concluded from page* 10)

figures striking the bells are strictly American. The figure of George Washington strikes the quarter hour

and that of Abraham Lincoln strikes the hour.

John Sandula came to the United States in 1907 and began work in a Detroit tool shop. He joined Simplicity when the company was organized at Gladwin, Mich., in 1923 and in the intervening years has seen the company develop from a small producer of gyrating screens to a manufacturer of numerous types of materials handling and sizing equipment for many industries. Many Simplicity employees attribute their own skills to John's careful tutorage and supervision through the years.

If you get up Durand way, take a look at John's handiwork.

—o—

How About a Day?: Chamber of Commerce of the United States recently published a 45-page booklet listing the special days, weeks and months for 1955. Evidently not a single day will pass that does not have special significance and most will have a commercial connotation. For example: Feb. 3-12 is Kraut and Frankfurter Week; Feb. 22, Pancake Day; Mar. 6-12, Peanut Week; Apr. 10-16, Honey for Breakfast Week; May 14-21, Let's Go Fishing Week (I must look into this); June 8, Expectant Father's Day; June 20-26, Bow Tie Week; Sept. 26-30, Sweater Week; Oct. 9-15, Save the Horse Week (yes, the automobile is here to stay); and Dec. 1-31, Eggnog Time. The list goes on and on. Perhaps it may be about time for some foundry group to sponsor a "Let's Use a Casting Instead of" Week.

F.G.S.

Meters by the millions ...

from metal melted by

6 DETROIT ROCKING ELECTRIC FURNACES

Recently, the 11,500,000th Neptune meter was produced. This, like the bronze-cased Neptune meters for 30 years, was made from metals melted in a Detroit Rocking Electric Furnace.

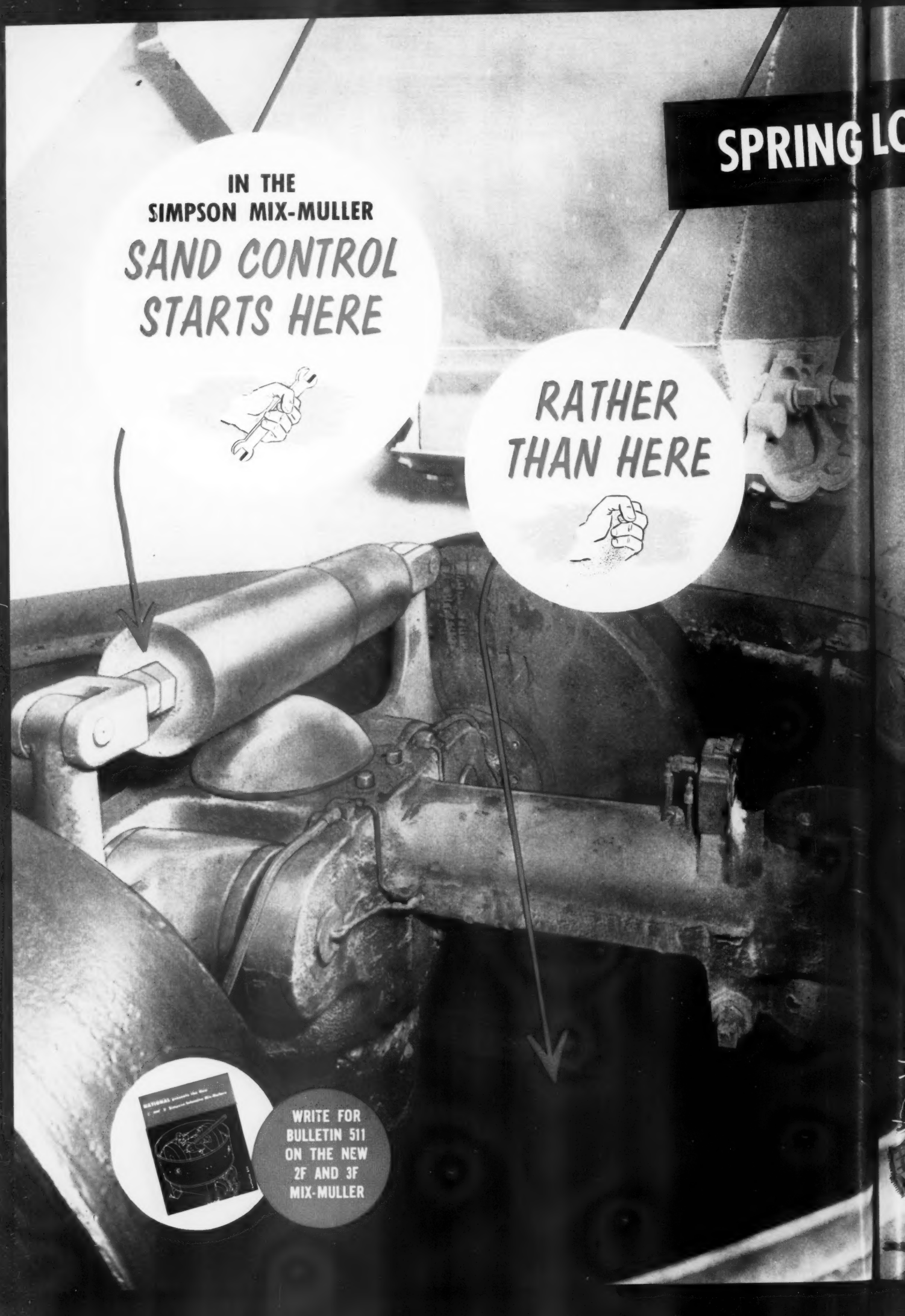
The six DEF Furnaces in Neptune Meter Company's foundry are under constant pressure to meet production demands which call for hundreds of tons of melt per month. To meet quality standards, melts must be uniform, of exact analysis, and produced with economy and speed.

The indirect arc and controlled rocking action of Detroit Furnaces bring important advantages to production of both non-ferrous and ferrous melts. To learn how these advantages can benefit *your* foundry operations, let our engineers analyze your melting requirements. Write today!

DETROIT ELECTRIC FURNACE DIVISION

KUHLMAN ELECTRIC COMPANY • BAY CITY, MICH.

Foreign Representatives: in BRAZIL—Equipamentos Industrias, "Eisa" Ltd., Sao Paulo; CHILE, ARGENTINA, PERU and VENEZUELA: M. Castellvi Inc., 150 Broadway, New York 7, N.Y.; MEXICO: Cia Proveedora de Industrias, Atenas 32-13, Apartado 27A3, Mexico 6, D. F., Mexico; EUROPE, ENGLAND: Birlec, Ltd., Birmingham.

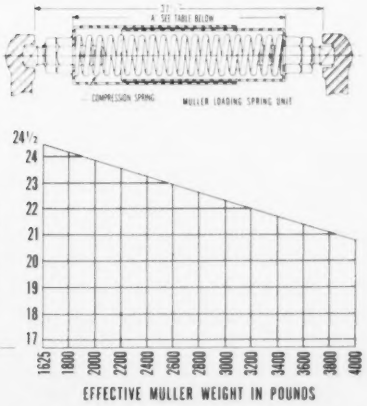

SPRING LO
IN THE
SIMPSON MIX-MULLER
SAND CONTROL
STARTS HERE
RATHER
THAN HERE
WRITE FOR
BULLETIN 511
ON THE NEW
2F AND 3F
MIX-MULLER

NG LOADED MULLERS MAKE THE DIFFERENCE!

● That's the business end of a hard-working 3F Simpson Mix-Muller on the opposite page. In a phone call on the first day it was used, the owner advised us of an unusual increase in green strength in his sand.

It turned out that he hadn't reduced the amount of bond he was accustomed to using—all of his new bought efficiency was going to strength. A simple adjustment of the spring tension on his mullers . . . *and* a 50% reduction in his bond consumption brought him more efficient control over his sand than he has thought possible after 30 years in the business.

That's why we say that the new F Series Mix-Muller is *more* than a mixer—properly used, it is a vital instrument of control over all sand properties and the flexibility afforded through spring loading provides the necessary versatility to meet *every* foundry's sand requirements.



HERE'S HOW IT WORKS

Now available on models having from 50 to 4000 lbs. batch capacity, spring-loaded mullers are designed to transmit variable muller pressure to the sand bed through mullers of comparatively light initial weight. In this manner, maximum muller pressures are developed as the sand increases in strength during mulling . . . when this pressure is *most* needed.

The chart at left shows how each muller, on the new 4000 lb. batch 3F Mix-Muller, can provide effective mulling pressures ranging from 1600 lbs. initial weight to 4000 lbs. pressure. That's a saving of 2400 lbs. in dead weight and your assurance of *positive* control over mixes from the slickest core sands to the toughest steel sands . . . at the turn of a wrench!

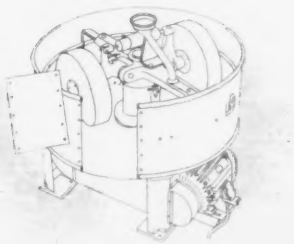
HOW THE NEW SIMPSON MIX-MULLER CAN GIVE YOU MORE FOR EVERY MULLING DOLLAR

SIMPLE, RUGGED, DEPENDABLE

● Years of practical mixer engineering, intensive research, testing and modernizing of long proven mixer designs combine to give you *today's* kind of sand control, operating and maintenance helps . . . in a mulling principle that has been an industry standard for over 40 years.

LOW MAINTENANCE

● Centralized lubrication, anti-friction bearings throughout and new, easy access door through crib are only a few of the many features that add up to long life, low cost, and easy maintenance for the new F Series Mix-Muller.



STATIONARY PAN — BOTTOM DISCHARGE

● In a Simpson, stationary pan principle and automatic bottom discharge mean that all power is used to *mix* . . . This adds up to longer life for your muller . . . lower operating costs.

National Engineering Company
(Not Inc.)
646 Machinery Hall Bldg. • Chicago 6, Illinois

PRODUCTS OF A PRACTICAL FOUNDRYMAN

JUST AS A NEGATIVE guarantees you an exact duplication of a photograph each and every time, you are always assured a

POSITIVE DUPLICATION of an original grinding wheel each and every time through the CINCINNATI (PD) Manufacturing Process.

Self-dressing action of CINCINNATI (PD) SNAGGING WHEELS

Saves you money

Increases production

Foundries and weld shops across the nation report that the CINCINNATI (PD) WHEELS specified for a snagging job by Cincinnati abrasive engineers require few, if any, dressings. With the right grade of wheel, new cutting grits are bared as soon as old grits get dull and inefficient. And whether you use stand, swing frame or portable grinders, CINCINNATI (PD) WHEELS save you money and increase production not only through self-dressing action . . . but through freer cutting action *and Positive Duplication.*

Just as a negative guarantees exact duplication of a photograph, the CINCINNATI (PD) *Manufacturing Process assures a Positive Duplication of the original wheel every time you reorder. Yet these better, cost-cutting* CINCINNATI (PD) WHEELS *are priced no higher than ordinary wheels.*

Positive Duplication (PD) is the result of extensive manufacturing research and the development of new standards of manufacture with 36 quality control steps. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike—providing the *same long wheel life, the same reduced operator fatigue and the same self-dressing action.*

CINCINNATI (PD) WHEELS are made in vitrified and resinoid bonds for ferrous and non-ferrous foundries and weld shops. They are available in a complete variety of popular sizes and shapes. We'll be happy to tell you about our complete line of straight wheels, cups, cones and plugs, and to prove to you how CINCINNATI (PD) WHEELS will make money for you. Just contact us and we'll send one of our representatives. Wire, write or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

FREE! **Send today for your copy of the new fact-packed, illustrated pamphlet on CINCINNATI (PD) Snagging Wheels.**

Sales Manager, Cincinnati Milling Products Division
Cincinnati Milling Machine Co.,
Department F, Cincinnati 9, Ohio

Gentlemen:

I want to know more about CINCINNATI (PD) Snagging Wheels. Please send me a copy of "How To Reduce Snagging Costs and Increase Production."

NAME_____ TITLE_____

COMPANY_____

STREET ADDRESS_____

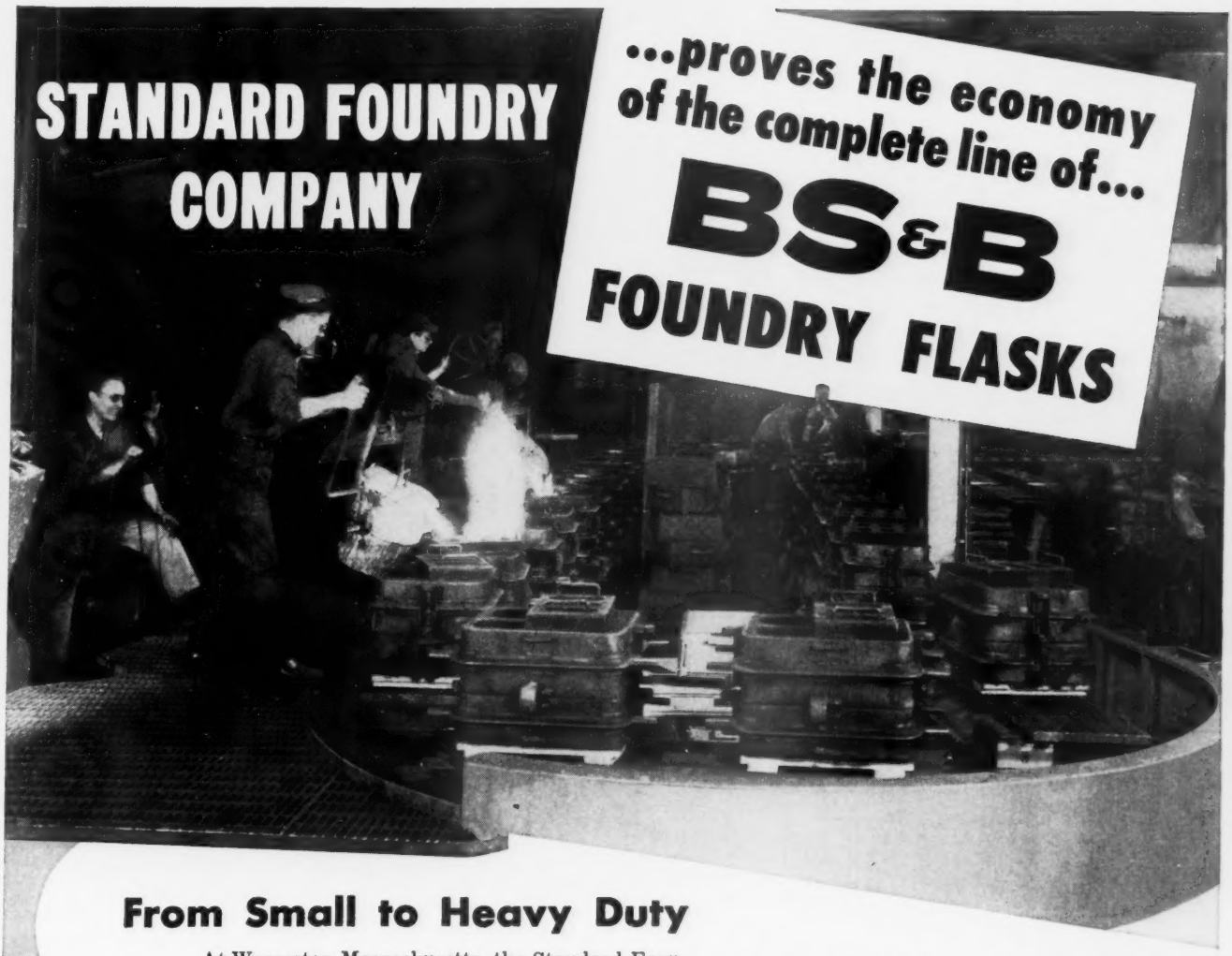
CITY_____ ZONE_____ STATE_____

CINCINNATI *Grinding Wheels*
THE CINCINNATI MILLING MACHINE CO.
Cincinnati 9, Ohio

STANDARD FOUNDRY COMPANY

...proves the economy of the complete line of...

BS&B FOUNDRY FLASKS



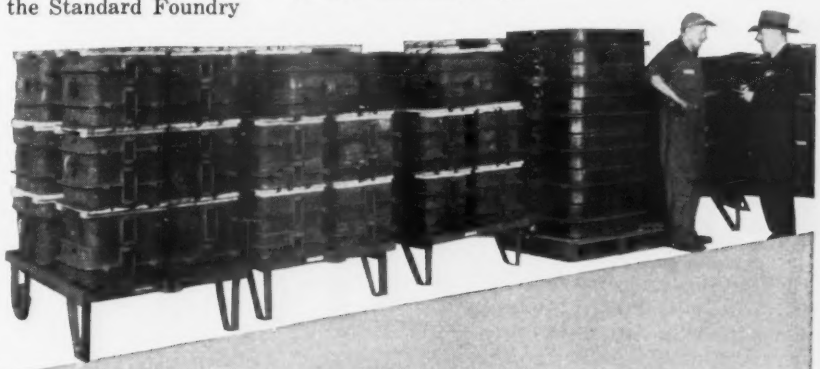
From Small to Heavy Duty

At Worcester, Massachusetts, the Standard Foundry Company turns out a great percentage of the grey iron castings used in the Central New England area.

Several years ago Standard started a major plant expansion. The result is a merry-go-round operation making this jobbing foundry one of the most modern and efficient in the country. Five years ago Standard began using the various sizes of BS&B Foundry Flasks. Performance under continuous, extensive and hard usage daily had already convinced Standard of the economy and low maintenance costs of BS&B Flasks. With plant expansion they needed more flasks. Understandably, they turned to BS&B. Part of the BS&B Flasks delivered recently are pictured here. Different styles of BS&B Foundry Flasks for making small to large castings are in operation in the Standard Foundry

For the tough jobs... the heavy jobs ...It's the BS&B HEAVY DUTY Flask

All types of BS&B Foundry Flasks . . . light, medium and heavy . . . are in extensive use in the foundry industry. Regardless of type, you'll get a tailor made flask, built to the particular requirements of the operation —what you want and need. Your requirements may be for any or all of these types. If yours is a tough, heavy job, we'll recommend the HEAVY DUTY . . . the only flask manufactured combining these three features— (1) Welding of bearing strips, both inside and out; (2) Cast steel trunnions; (3) Cast steel pinlugs and clamp lugs.



Write Foundry Flask Division 7-AR12 for FREE Handbook

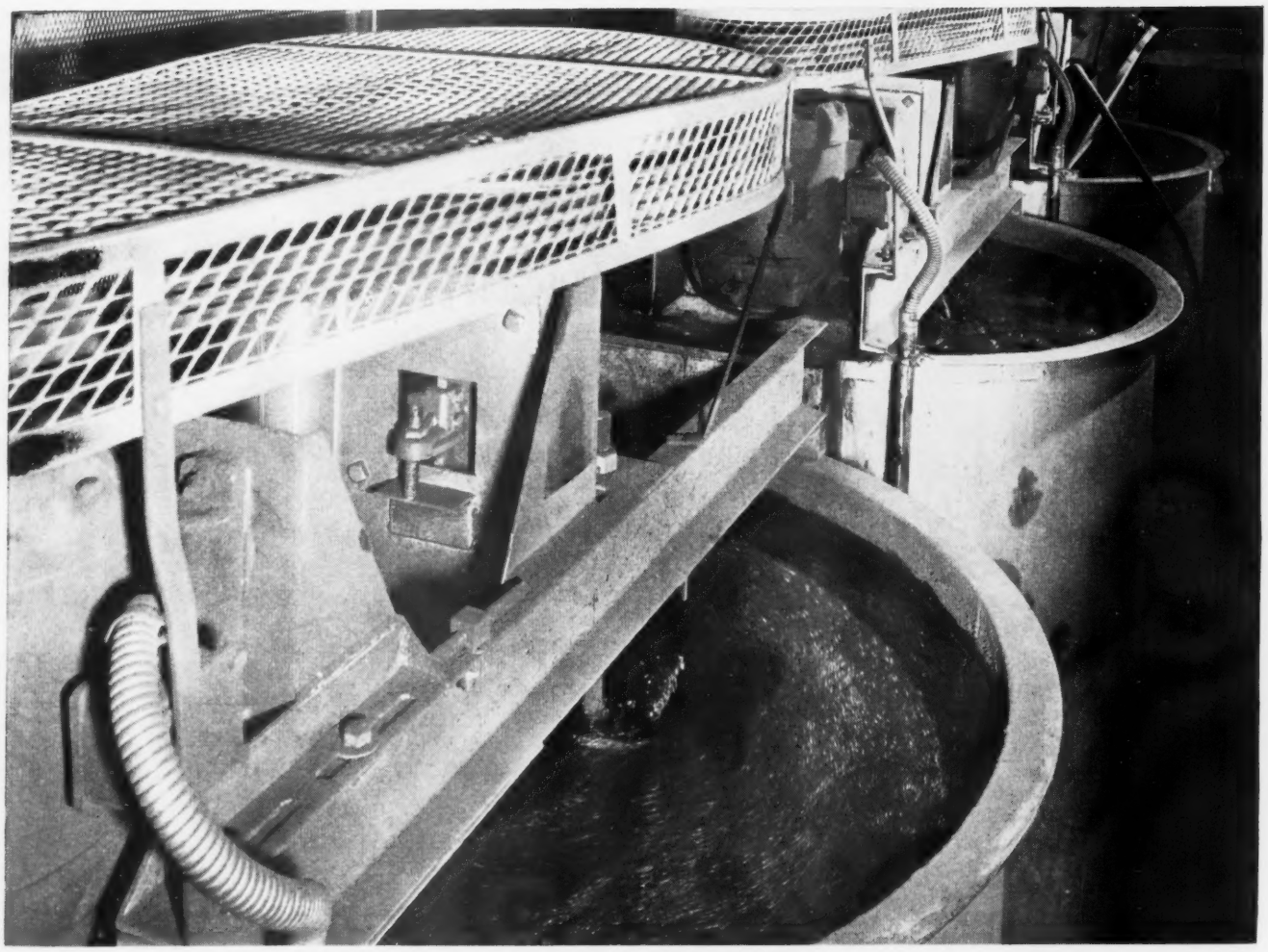
The BS&B Foundry Flask Handbook is a handy catalog containing useful foundry information ... includes easy-to-order system.

FOUNDRY OUR 60TH YEAR BS&B FLASKS

BLACK, SIVALLS & BRYSON, INC.

Kansas City 3, Missouri — 7500 East 12th

Foundry Sand Reclamation



One of the big factors of high production, low costs and simplicity of operation is the patented Denver Heavy Duty Sand Scrubber pictured, above, in Denver Sand Reclamation System. Bonding material on the surface of sand grains are removed by attrition of grains striking one another inside the scrubbers at high velocity in a water and sand mix.

Foundry Sand Costs Are Cut, Sand Disposal Problems Are Solved With Denver Sand Reclamation System

Denver Sand Reclamation offers foundries another means of cutting costs and increasing profits. One Denver Sand Reclamation System, at a foundry producing 400-tons of castings per month, saved the foundry $42,864.00 a year — that's $42,864.00 in added profits.

New Sand Use Cut 50%: During the first year, 1120 lbs. of new sand per ton of castings was used, compared with 2400 lbs. of new sand per ton of castings before Denver Sand Reclamation. Cost of the 1280 lbs. of reclaimed sand used per ton of castings, on this basis, is $1.20. Goal is to cut new sand use to 600 lbs.

Reclaimed Sand Makes Better Castings: The Denver Reclamation Systems are so effective that many molders prefer characteristics of reclaimed sand over characteristics of new sand. This is because the reclaimed sand is more stable. In addition to the dollar saving features of Denver Reclamation Systems, several foundries have installed systems to solve their problem of disposing used sand—80% to 90% recovery of sand is realized.

No Charge Sand Test: We would like to demonstrate what the Denver Sand Reclamation Process will do on your discarded sand. A 100 lb. sample is sufficient. There will be no charge or obligation for a preliminary sand test. We will return the cleaned sand for your inspection and analysis.

In order that we might have as much information as possible for this preliminary test, we would appreciate your writing us first, so we can supply you a questionnaire of data necessary to make the test. Remember, there will be no charge or obligation.

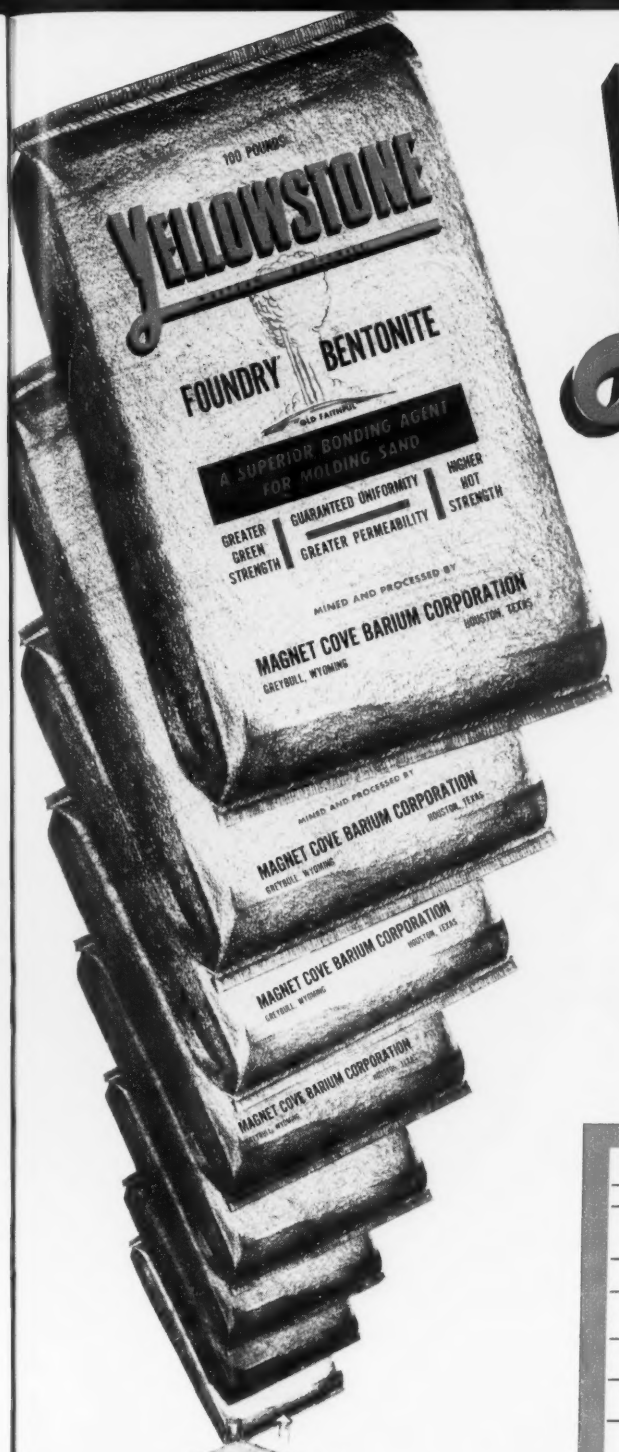
Find out how you can cut your foundry sand costs —solve used sand disposal problems! Write for the Sand Reclamation Test Questionnaire, today!

DECO FLOTATION ENGINEERS — DENVER EQUIPMENT COMPANY 24 HOUR SERVICE

DENVER EQUIPMENT COMPANY

1400 SEVENTEENTH ST. DENVER, COLORADO

DENVER, NEW YORK, CHICAGO, EL PASO, SALT LAKE CITY, VANCOUVER, TORONTO, MEXICO, D.F., LONDON, JOHANNESBURG



YELLOWSTONE

WESTERN BENTONITE

THE SUPERIOR SAND BONDING AGENT

Molding sands containing Yellowstone Western Foundry Bentonite have been proved in test after test to have greater green strength and higher permeability. Only a small amount of Yellowstone is required because of its great strength. The superior bonding characteristics permit the use of smaller amounts of bond and less water to temper. For better casting finish and less casting defects Yellowstone is your answer.

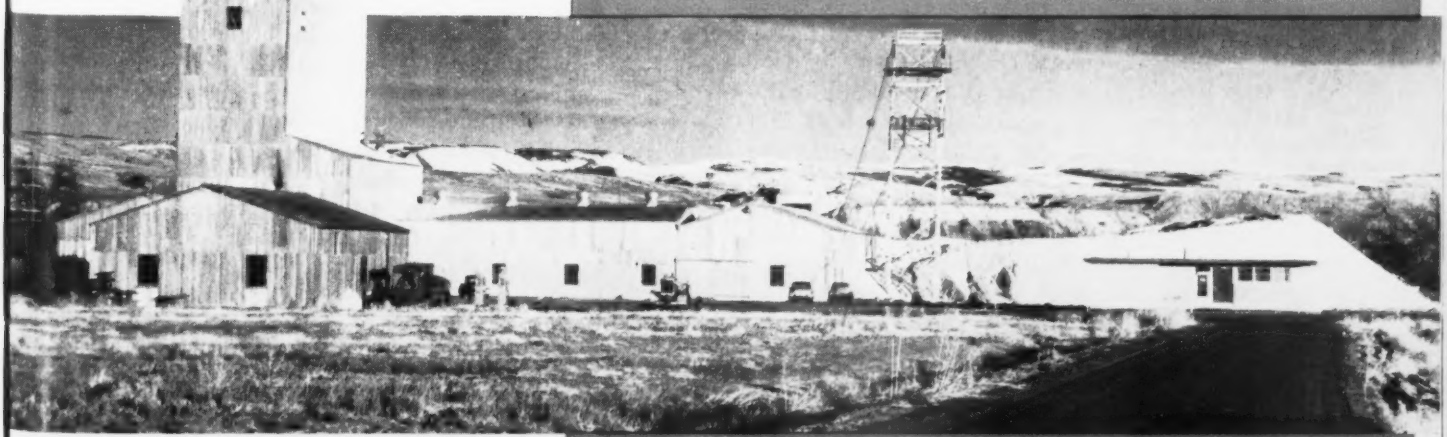
This superior performance is a result of Yellowstone bentonite being selected from the finest deposits of colloidal bentonite at the Yellowstone mines at Greybull, Wyoming. A stockpile containing in excess of 200,000 tons and special processing equipment in the world's most modern bentonite plant guarantee uniform quality in every bag of Yellowstone.

Ask your distributor for Yellowstone Western Foundry Bentonite.

Comparative tests by an independent research laboratory* prove Yellowstone's superiority. Tests were made with an added clay content of 5%.

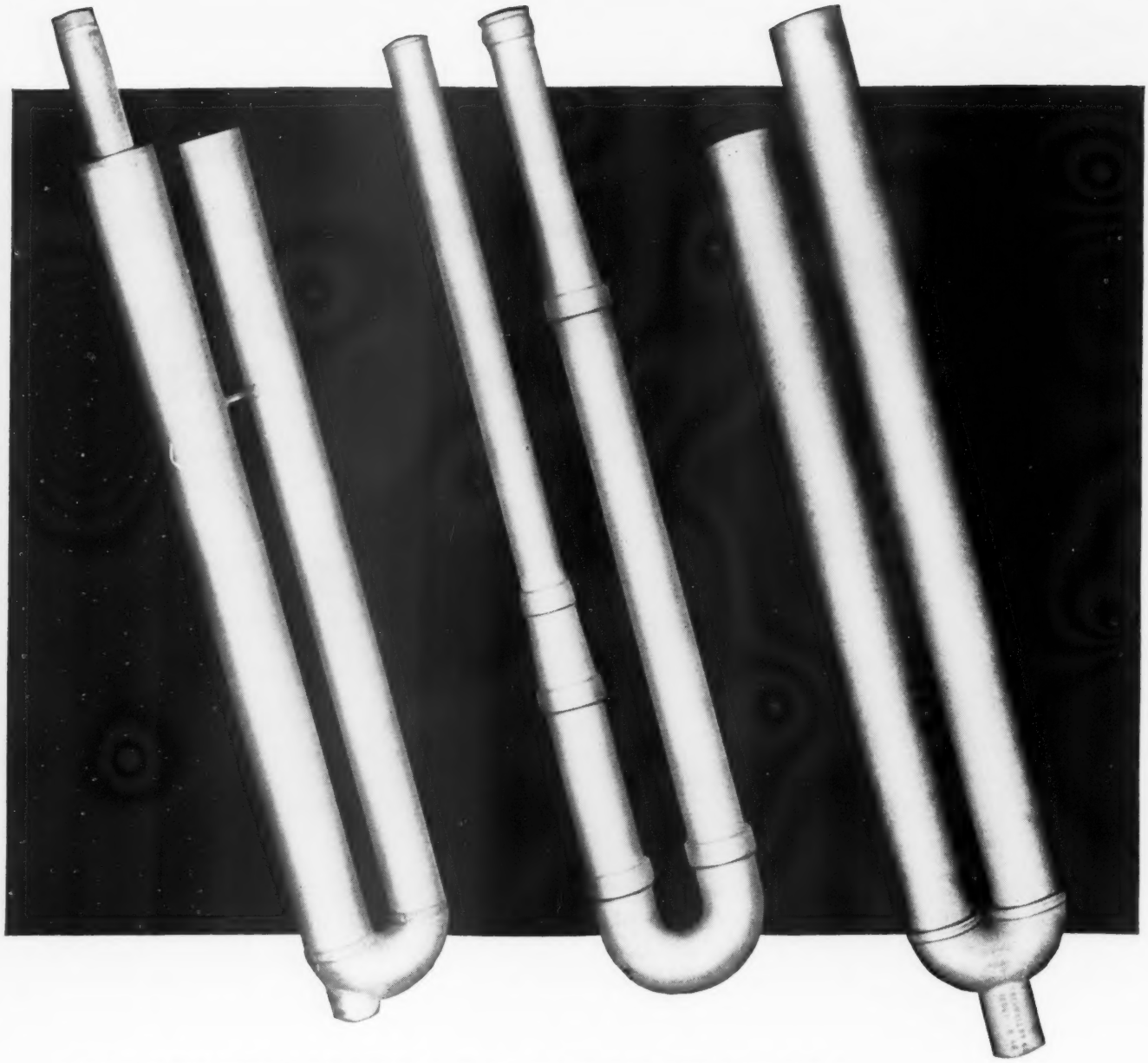
	GREEN PROPERTIES (a)						DRY PROPERTIES (b)	
	pH	Green Compressive Strength psi	Permeability AFS Units	Toughness psi (c)	Deformation in./in.	Hardness (d) AFS Units	Compressive Strength psi	Permeability AFS Units
Yellowstone	9.4	18.1	107	145	0.008	93	60.5	115
Western Bentonite A	8.9	12.5	92	140	0.011	86	64.3	108
Western Bentonite B	9.3	15.5	86	134	0.009	85	76.4	102
Western Bentonite C	9.7	12.9	95	136	0.011	88	29.0	108

(a) Standard AFS Procedures.
(b) Oven dried 2 hours at 220F to 230F.
(c) Product of green compressive strength (psi) and deformation (inches per inch).
(d) Hardness measured on bottom of rammed specimen.
*Name on request.



THE WORLD'S MOST MODERN BENTONITE PLANT

MAGNET COVE BARIUM CORPORATION
ONE OF THE DRESSER INDUSTRIES
POST OFFICE BOX 6504 • HOUSTON 5, TEXAS



GET MORE HOURS OF SERVICE FROM

Thermalloy* radiant tubes

Make Electro-Alloys your source if you want radiant tube assemblies that will give more life and reduce maintenance costs.

All components are produced in suitable analyses under close metallurgical supervision, and with X-ray control. The straight tube sections are centrifugally cast in such a way that wall thickness is uniform throughout; i. e., inside diameter and outside diameter are concentric, and thickness is the same the full length of the tube. All finished assemblies are pressure-tested before shipment to insure freedom from leakage. As a result, you are assured of radiant tube assemblies that last longer without cracking, warping or sagging.

Whatever your needs in radiant tube assemblies or other heat-treating equipment—you'll get more operating economy from high heat-resistant Thermalloy castings. Let us know your requirements. Call your nearest Electro-Alloys engineer or write Electro-Alloys Division, 5008 Taylor Street, Elyria, Ohio.

AMERICAN Brake Shoe COMPANY

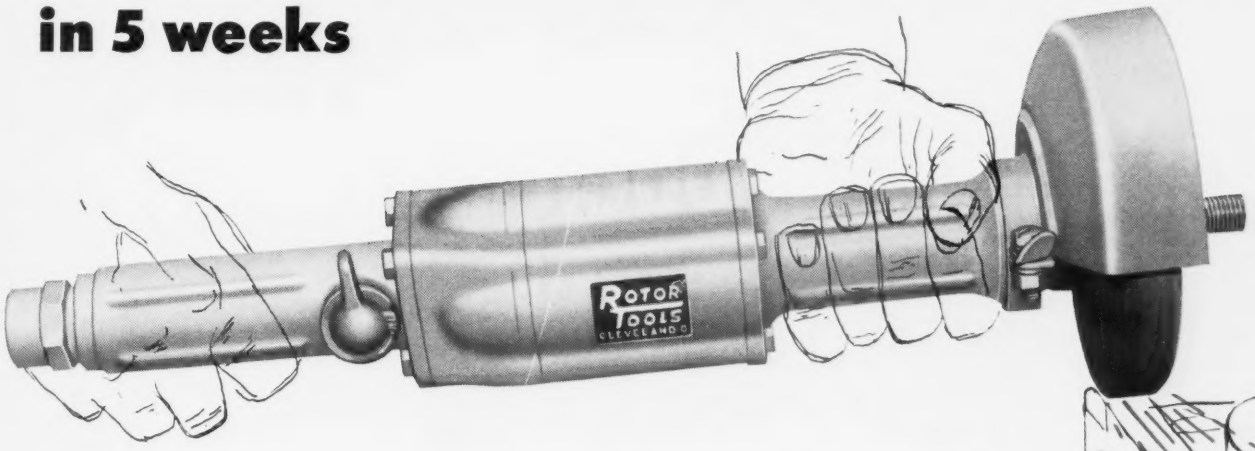
ELECTRO-ALLOYS DIVISION

ELYRIA, OHIO

*Reg. U. S. Pat. Off

DOUBLES OUTPUT

New Rotor D-6 Air Grinder pays for itself in 5 weeks



JOB: Removing flash and parting lines from steel castings. Tool used 50% of production time.

FORMERLY: Used 6″ electric grinders at 3700 rpm. Required 10 minutes per casting.

NOW: Using New Rotor D-6 Air Grinders at 6000 rpm. Job time cut to 5 minutes.

RESULTS: Output doubled. Savings paid for new Rotor Grinder in 5 weeks. Wheels last longer. Tool is 5 lbs. lighter, easier to handle.

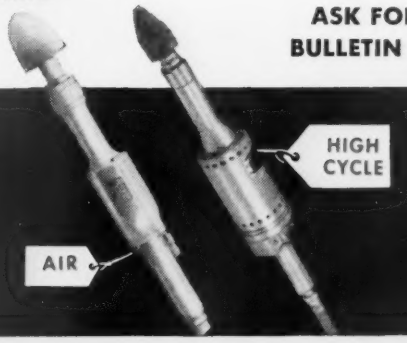
A demonstration on *your* work will show how *you* can improve production with these new Rotor Grinders. Ask for proof.

SPECIFICATIONS FOR ROTOR D-6				
RPM	WHEEL SIZE		LENGTH†	WEIGHT*
	Elastic	*Vitrified*		
6000	6″	4″	22¼	9¼
4500	8″	5″	22¼	9¼
4100	8″	5″	22¼	9¼

* For D-6S straight handle. Add ¾ lb. for D-6G grip handle.
† Deduct 1½″ for grip handle.

After 5 weeks, it's pure savings!

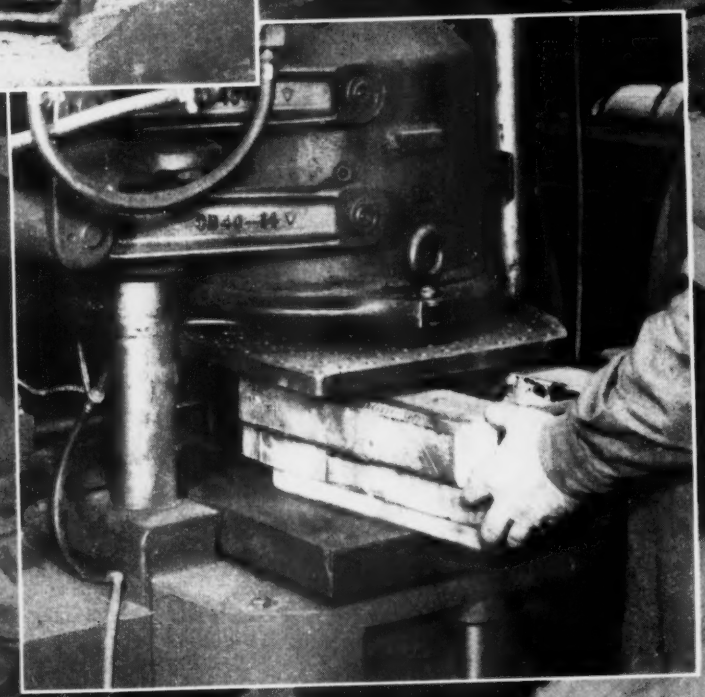
ASK FOR BULLETIN 44



THE ROTOR TOOL CO.
CLEVELAND, OHIO

UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS

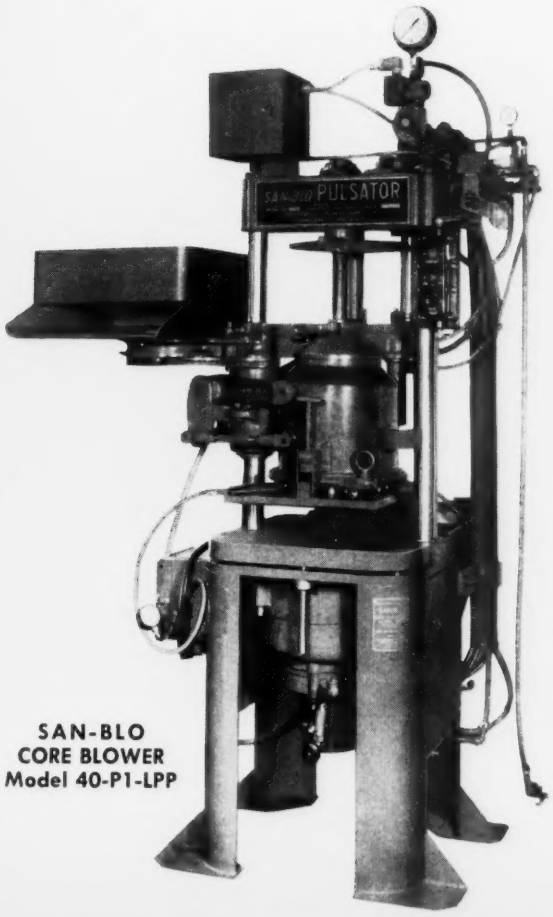
don't ram wooden boxes . . .



when you can blow them . . .

but remember—you'll need a SAN-BLO to do it!!

The SAN-BLO Core Blower, with low pressure prefill and pulsator type blow, is the only Core Blower designed and recommended for blowing wooden as well as metal core boxes!



SAN-BLO CORE BLOWER Model 40-P1-LPP

Now you can have all the advantages of high speed core blowing for *wooden core boxes, TOO!* Because the SAN-BLO will blow high quality cores in the same boxes* you're now ramming—blow them *safely* . . . with *negligible* core box wear . . . with *minimum,* (if any) rigging. Here's why:

SAFETY PULSATOR TYPE BLOW consists of 2, 3 or 4 short, quick, ramming blows—rather than the conventional, continuous blow. *Prevents* dangerous pressure build-up within the core box during the blowing cycle . . . *eliminates* the possibility of blowing core box apart.

WEAR LOW PRESSURE PREFILL "riddles" a layer of fluffed sand on the bottom of the core box, *before* full ramming pressure is automatically cut-in. *Eliminates* the sand blasting or gouging of the bottom of core box, during the blowing cycle.

RIGGING Federal's new UNIVERSAL, QUICK-CHANGE, BLOW AND VENT PLATE ASSEMBLY *is standard equipment* on all Pulsator model SAN-BLO machines. Blow plates for open-top boxes can now be made up in *less than 10 minutes time,* at a cost of but a *few dollars,* and can be changed on the machine in a *matter of seconds.* Further, since a majority of existing wooden core boxes are open-top, the universal vent plate generally eliminates the necessity of inserting vents in core boxes. As a result, the blowing of short-run cores becomes as economical as production runs.

MORE SAN-BLO FEATURES: "Cyclo-Air" sand chamber with motor-driven agitator and aerating air circuit . . . adjustable sand chamber height . . . air-oil-controlled automatic draw . . . single-push-button control . . . wooden and metal core boxes blown on the same machine . . . cores weighing from a few ounces to full capacity of machine blown with one sand chamber, at maximum blowing efficiency.

To learn more about blowing wooden core boxes safely, efficiently and economically . . . write our home office and request our representative to call.

* *Most existing wooden core boxes will withstand the clamping and blowing pressures developed by the SAN-BLO core blower.*

FEDERAL

San-Blo Division

The **FEDERAL FOUNDRY SUPPLY** *Company*

4600 EAST 71st STREET, CLEVELAND 5, OHIO

FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION INC. MEMBER FEMA

SALES OFFICES IN . . . CHICAGO . . . DETROIT . . . LOS ANGELES . . . MILWAUKEE . . . NEW YORK

Announcing...

Electromet's New Electrolytic Chromium Metal

FOR ADDING CHROMIUM TO

- HIGH-TEMPERATURE ALLOYS
- CORROSION-RESISTANT ALLOYS
- ELECTRICAL RESISTANCE ALLOYS
- NON-FERROUS METAL-CUTTING TOOLS
- CHROMIUM BRONZES
- HARD-FACING MATERIALS
- HIGH-STRENGTH ALUMINUM ALLOYS

Now, for the first time, electrolytic chromium metal is commercially available in tonnage quantities. It is being manufactured in ELECTROMET's new Marietta, Ohio plant. *Electrolytic chromium can be advantageously used whenever additions of chromium of low iron content are needed.*

For further information about electrolytic chromium metal and other ELECTROMET ferro-alloys and metals, please contact the nearest ELECTROMET office listed below.

The term "Electromet" is a registered trade-mark of Union Carbide and Carbon Corporation.

ELECTRO METALLURGICAL COMPANY

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N. Y.

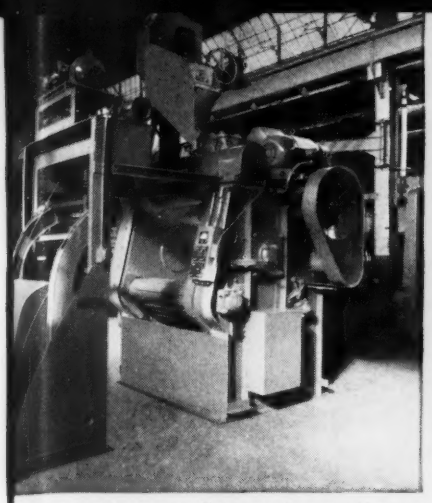
OFFICES: Birmingham • Chicago • Cleveland • Detroit
Houston • Los Angeles • New York • Pittsburgh • San Francisco

In Canada: Electro Metallurgical Company, Division of Union Carbide Canada Limited, Welland, Ontario

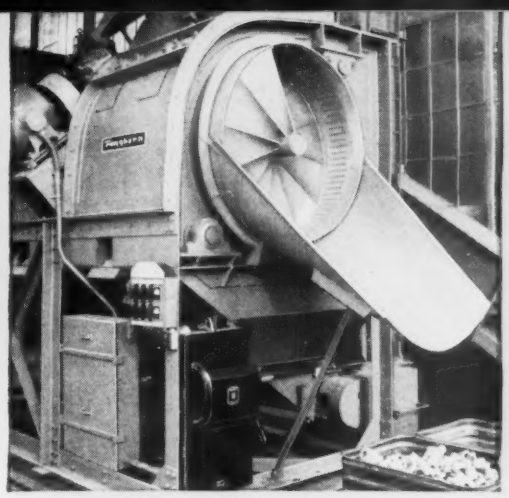
Electromet

TRADE-MARK

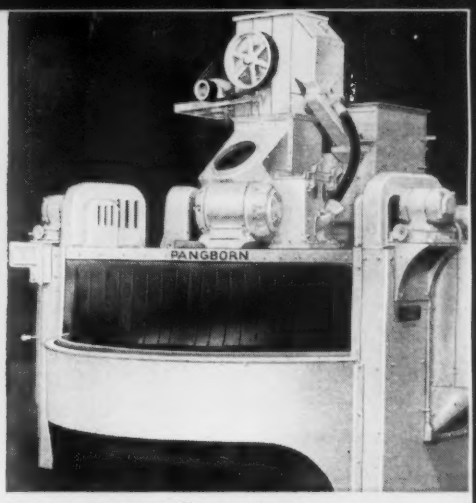
Ferro-Alloys and Metals



Pangborn Blastmaster® Barrels for top efficiency in batch cleaning. Newest addition to Pangborn line, features abrasive-tight door and automatic throw-out torque arm.



Pangborn Continuous-Flo ROTOBLAST Barrels for cleaning steady flow of miscellaneous work quickly. Operated by one man on production line basis.



Pangborn ROTOBLAST® Tables for semi-continuous blast cleaning. Types and sizes for castings of all sizes, surfaces, intricate shapes, and pockets.

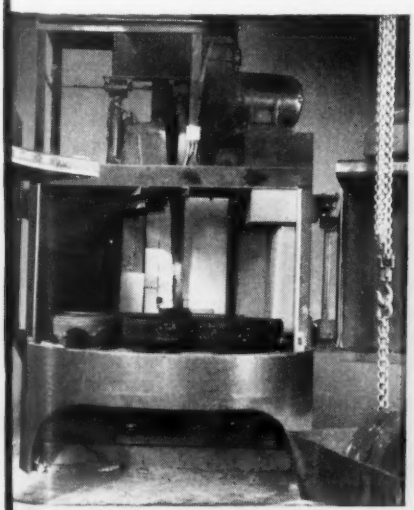
Pangborn's 50 years of progress

offer you a complete line of equipment for every blast cleaning and dust control need

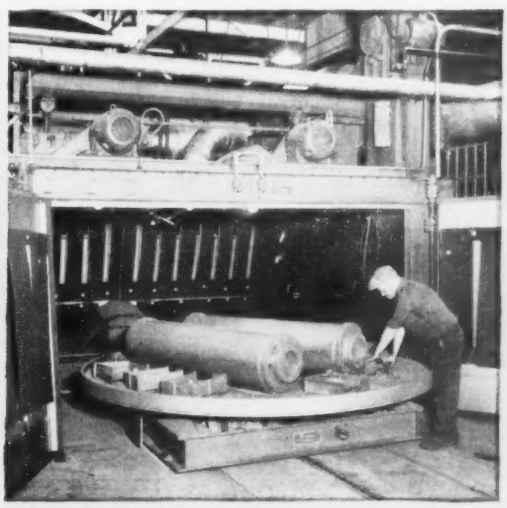
Fifty years of know-how . . . a half-century of research and development . . . and today Pangborn Blast Cleaning and Dust Control Equipment promises *and delivers* better, faster, cheaper performance on any foundry job. Shown here are just a few machines from Pangborn's *complete line* of equipment.

Pangborn engineers and equipment can save *you* time, labor, and money. Our engineers will be happy to work closely with you, in recommending the exact Pangborn unit you need, and in developing new equipment when necessary. No matter what you clean —large or small castings, ferrous or non-ferrous work . . . or whatever dust problem you have, it will pay you to find out how Pangborn can help you.

Send for the Pangborn bulletins that fit your needs. Write: PANGBORN CORPORATION, 1400 Pangborn Blvd., Hagerstown, Md.



Pangborn ROTOBLAST Table-Rooms clean castings from a few pounds to 2½ tons. Extremely efficient for jobbing foundries. Perfect for all-purpose blast cleaning.



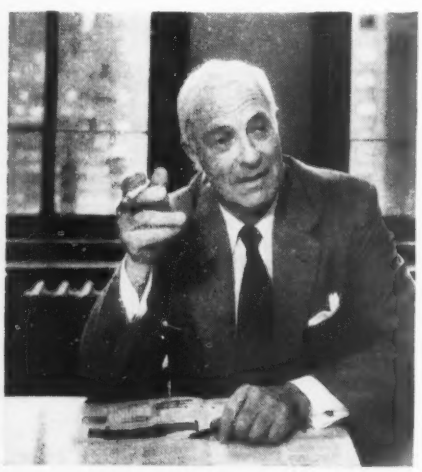
Pangborn Airless ROTOBLAST Rooms for general blast cleaning of extra-large and miscellaneous castings. Operated from outside.

Pangborn Dust Control Equipment to reduce housekeeping costs, minimize dust damage to machinery, improve employee morale and community relations. For any size requirement.

(Advertisement)

How Do Lightweight Refractories Cut Fuel Costs And Boost Furnace Output?

Here, certainly, is a timely question. There's a heavy squeeze today on most furnace operators for lower costs, larger production . . . or both. And despite all the economies they've put into effect so far, they're still searching hard for ways to make their furnace dollars do a bigger job.



The following discussion brings out a number of facts, often overlooked, about the money-saving, profit-building potentials inherent in *lightweight* insulating firebrick.

Q. *First of all, just what do you mean by "lightweight" insulating firebrick?*

A. Compared with dense, fireclay brick weighing approximately 7½ to 8½ pounds each, insulating firebrick range from about 3½ pounds down to slightly over 1 pound for various temperature requirements.

Q. *What does this light weight have to do with lower production costs?*

A. Briefly, heavy furnace linings waste your fuel dollars two ways:

They soak up and store large quantities of heat which are lost when the furnace is cooled; and they conduct and lose too much heat through the wall.

Lightweight insulating firebrick, on the other hand, contain millions of tiny air cells, heat up and cool quickly, absorbing and storing very little heat. Also, they resist heat flow, keeping it inside the furnace to do productive work.

Q. *I can see why you would save on fuel — but how much?*

A. There's no single answer to that question — there are too many variables to be considered. But to give you an idea of these savings, here are a few actual examples:

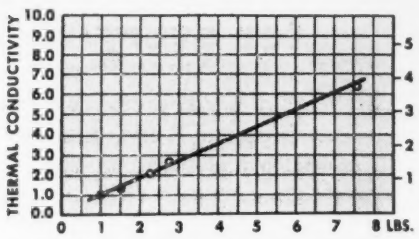
The operator of a large forge furnace cut his fuel costs more than 50% after changing to *lightweight* insulating firebrick.

A manufacturer of electric kilns states that insulating firebrick result in heat savings of fully 25%.

A magnesium melting crucible furnace that formerly used 1,000,000 BTU's per hour now does the same job with 500,000 BTU's, thanks to insulating firebrick.

Q. *Increased production has also been pointed out as an advantage of insulating firebrick. How do you explain this?*

A. Again the answer lies in lightness of weight. Because lightweight firebrick store and conduct less heat, they come up to operating temperature faster — cool down faster, too. This means — shorter heating cycles.



Relation between weight and thermal conductivity for several brands of kaolin base refractories. (mean temperature, 900F)

Secondly, because lightweight firebrick conduct far less heat than heavy, dense firebrick, you don't have to build as thick a wall. This gives you more hearth area per square foot of floor space.

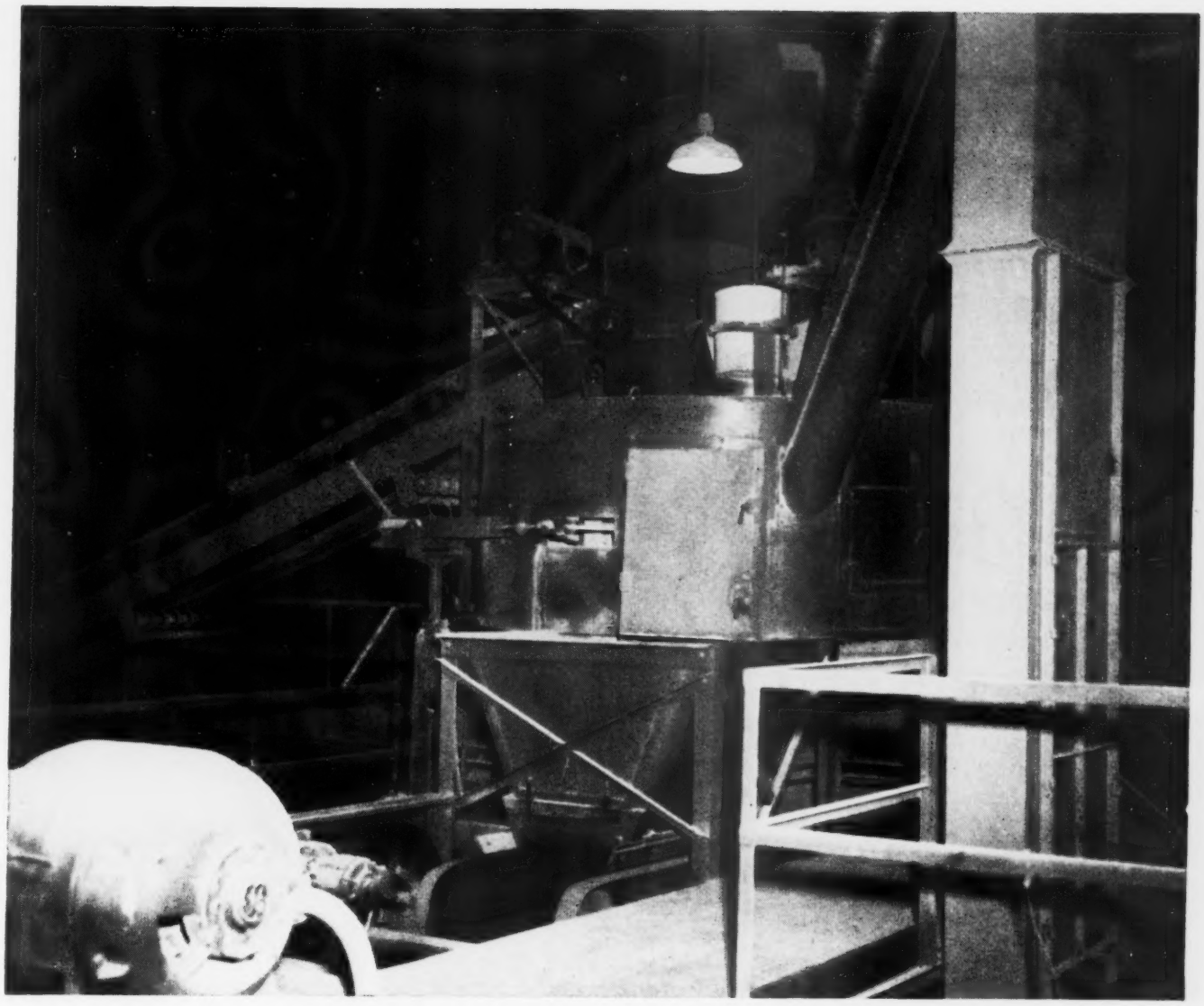
Thirdly, lightweight firebrick respond more rapidly to changes in furnace heat input, which means closer temperature control and fewer rejects in many instances.

It's just like adding extra furnace capacity without adding to your furnace investment.

Q. *Are there any differences in the performance of the various brands of insulating firebrick available?*

A. Naturally, the *lighter* the brick the greater the fuel savings and furnace output. And the lightest insulating firebrick of all, for any temperature range — if you'll pardon our mentioning it — are B&W Insulating Firebrick.

THE BABCOCK & WILCOX CO.
Refractories Division
General Offices:
161 East 42nd St., New York 17, N. Y.
Works: Augusta, Ga. R-508



Pictured here is one of nine No. 920 Clearfield Mixers, all in one of the largest industrial plants in the East.

make your
continuous sand
handling system
really efficient

with a

Clearfield Mixer

Clearfield Mixers perform perfectly in continuous sand handling systems. Their short mixing cycle, which can run as low as one minute, permits constant delivery of prepared sand either by the use of multiple mixing units or by the provision of storage bins preceding and following the mixers.

There's a Clearfield Mixer for every sand preparation need. Write today for Catalog No. 83 for complete details.

CLEARFIELD MACHINE CO.

CLEARFIELD, PENNSYLVANIA

How WESTINGHOUSE *saves* $37,000 *yearly* at its Trafford, Pa. Foundry

■ This plant formerly loaded and unloaded bagged material, handled barrels and stored patterns by manual methods. Today fork trucks have mechanized all these operations. Result: *an annual saving of $37,000.*

In the warehouse, for example, the fork trucks now stack materials on pallets—right up to the rafters. Indirect benefits: space saving, fewer accidents, less material damage. Direct benefits: substantial savings in labor costs.

Fork-truck handling and tiering of patterns eliminated back-breaking work, increased storage capacity 500% and made additional labor savings.

Unloading bagged material (wood flour, sea coal, mogal, pich, etc.) and fire brick (formerly manhandled one at a time) is now done in palletized unit loads—another big cost saver. And still more money is saved by handling barrels with a Baker 4-Purpose Carriage truck and drum shoes.

Write for 6-page special report on the application of Baker attachments to various loads. The Baker-Raulang Co., 1202 W. 80th Street, Cleveland 2, Ohio.

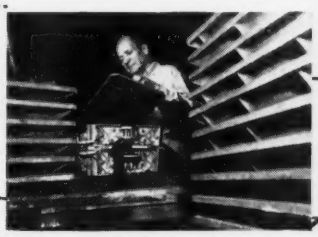
Baker®
industrial trucks

HERE'S WHY these foundries bought Edco Dowmetal Bottom Boards

Results! Satisfaction! Here are just a few of the progressive foundries where Edco Dowmetal Bottom Boards are in use. We have eliminated their Bottom Board problems—with resulting dollar savings—by producing for them a top-quality, permanent, yet easy-to-handle Bottom Board. Possibly you have a similar problem—or one which you feel is a "tough one," without a definite answer. Either way, we would welcome the opportunity to talk to you about it.

Write us, or phone MAnsfield 6-7330 for price schedule and list of 83 standard sizes available from stock.

"EDCO Dowmetal Bottom Boards eliminate swelled castings" . . . says E. F. Dublinski, Foundry Superintendent, Mid-City Foundry Co., Milwaukee, Wis.



"We cut our board losses from 7500 down to 12 . . . by switching to EDCO Dowmetal Bottom Boards"—says R. D. Baysinger, Manager, Foundry Division, Greenlee Bros. & Co., Rockford, Illinois.

"Our EDCO Dowmetal Bottom Boards have paid for themselves in one year . . . " says Emmett Torkelson, Foundry Superintendent, Louis Meskan Brass Foundry, Inc., Chicago, Illinois.

"Rejects reduced to an absolute minimum since using EDCO Dowmetal Bottom Boards" says Bob Petcher, Foundry Superintendent, Josam Mfg. Co., Michigan City, Ind.

"Our EDCO Dowmetal Bottom Boards Hold Up at High Temperatures . . . " says Robert H. Garrett, General Foreman, Lebanon Steel Foundry, Lebanon, Pennsylvania.

"Burning and Breakage loss not a factor since using EDCO Dowmetal Bottom Boards" . . . says Olney Foundry, Link-Belt Company, Philadelphia, Pa.

CHRISTIANSEN CORPORATION

210 SOUTH MARION STREET • OAK PARK 1 (Chicago Suburb), ILLINOIS

EDCO DOWMETAL BOTTOM BOARDS • EDCO ALUMINUM INGOT

Another revolutionary development...for

SLOW SPEED *snagging of* **GRAY IRON** *and* **MALLEABLE IRON**

The new NORTON K BOND†

adds the "TOUCH of GOLD" that raises wheel-life and efficiency to new highs on gray and malleable iron slow speed snagging jobs

As Good As They Look! You'll know Norton K Bond CRYSTOLON wheels by their distinctive appearance, as well as by their greatly stepped-up performance. Now available in standard vitrified wheel sizes for floor and bench stands and swing frames, as well as in smaller sizes and cones for portable grinders.

Now, after years of continuous development, the new Norton K Bond is ready to bring you faster, freer cutting action and much longer wheel-life on your slow speed gray and malleable iron rough grinding jobs.

It's the most radically improved vitrified bond ever produced for these applications — and so ideally suited to them that CRYSTOLON* wheels bonded with it are far ahead, from every performance angle, of any wheels you ever used before.

5 big advantages of K Bond CRYSTOLON wheels

1. **Faster, freer cutting action**
2. **Much longer wheel-life**
3. **Less frequent dressing**
4. **Hold corners better**
5. **Consistently duplicated**

Already the new K Bond wheels have been thoroughly job-tested, on a wide range of floor stand and bench stand jobs, in foundries throughout the country. And report after report shows that these new wheels are consistently outlasting other wheels, grinding off more metal per dollar and cutting production costs on countless every-day slow speed gray iron and malleable iron grinding jobs.

Try the new K Bond in your cleaning room

The "Touch of Gold" Is Job-Proved. During extensive field testing, the new Norton K Bond CRYSTOLON wheels have made a big hit with operators experienced in rough grinding malleable and gray iron castings. Why not get first-hand reports on these greatly improved wheels? Try them on your own floor stands and bench stands.

PERFORMANCE IS THE PAY-OFF!

Read these reports on tests of K Bond CRYSTOLON wheels made in users' cleaning rooms

From a large eastern piston ring plant:
Ground on the average 11,000 more rings with a K Bond wheel than with any wheel formerly used. Best wheel yet on Lehman piston ring grinders. Re-ordering 100.

From a leading malleable iron foundry:
Lasted 20% longer than previous standard wheels. Very good wheels in every respect.

From a southern gray iron foundry:
K Bond wheels easily the best ever used. Re-ordered in 40-wheel quantities.

From an eastern gray iron foundry:
Increased wheel-life from 80 to 120 hours. Reduced operator fatigue. Several 50-wheel quantity re-orders.

From a middle-western foundry:
K Bond wheels excellent performers. Proved faster cutting. Lasted a week longer than other wheels under same conditions.

See your Norton Distributor

about arranging a test of the new K Bond CRYSTOLON wheels in your plant. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your phone directory, yellow pages. Behr-Manning Corporation, Troy, N. Y., is a division of Norton Company. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass. W-1562

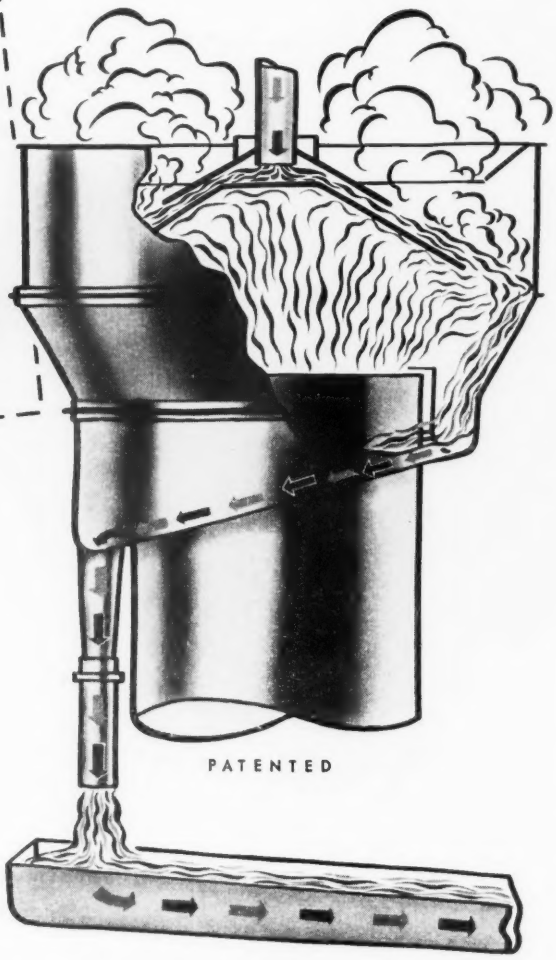
NORTON
ABRASIVES

Making better products...
to make other products better

†Patent applied for
*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

Years ahead in features that favor your budget-

"SW" CUPOLA COLLECTORS



Budget conscious foundry management has singled out Schneible for dollars and cents value in cupola fly-ash control equipment. Wherever you are, note the cupolas that are capped with "SW" Cupola Collectors. Large and small producers alike agree they do the job *better for the least.*

Schneible patented "SW" Collectors have eliminated endless man-hours of clean-up work to protect expensive facilities from deterioration and more than paid their installation in savings on plant maintenance costs.

Better employee and public relations and more over-all productivity are added benefits enjoyed by foundries equipped with these efficient Cupola Collectors.

Latest Bulletin 554 covers in detail many more *plus* features, arrangement and helpful test data. Request your copy today without obligation. We will arrange a tour of Schneible equipped foundries in your area for interested prospective buyers.

★ SIMPLICITY
★ ACCEPTABILITY*
★ FLEXIBILITY
★ EFFICIENCY
★ DEPENDABILITY
★ LONGEVITY

*Meets all Industrial Pollution Codes (except one).

CLAUDE B. SCHNEIBLE COMPANY
P. O. Box 81, North End Station • Detroit 2, Michigan

Cable Address: CBSCO
European Licensee: Elex S. A., Zurich, Switzerland

FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION INC. MEMBER FEMA

Write for Bulletin 554 without obligation

SCHNEIBLE

LATE NEWS

NOVEMBER 26 1954

RISING TREND: All evidence indicates that the recent improvement in general business will continue into the first quarter. Most business men appear to share this view. A survey by Dun & Bradstreet Inc. of 1300 business executives shows that 56 per cent of them expect higher sales next quarter than a year ago; 13 per cent look for lower sales and 31 per cent anticipate no change. This is the first time in over a year when a majority of the men queried have expected an increase in sales. Highlights now brightening the industrial picture are 1) steelmaking, which has expanded steadily for ten weeks, 2) automobile production and sales, currently topping levels of a year ago, and 3) the sustained boom in construction, with good prospects for an even greater volume in 1955. Growing demand for pig iron and coke in various sections of the country confirm reports of moderate pickup in foundry operations the last few weeks.

SCRAP EXPORTS: Protests by consumers that exports of iron and steel scrap are expanding too rapidly are bringing some results. Bureau of Foreign Commerce now is granting licenses for exports for only three months ahead instead of for six months and is requiring evidence that the scrap is available. These are regulations that were in effect before being dropped Apr. 1. One proposal that has met favor with some consumers and exporters is that the volume of shipments be adjusted according to the rate of domestic scrap consumption. It has been predicted that exports next year will reach 2½ million tons if some restrictions are not applied. Licenses issued through mid-October involved more than 1½ million tons. Not since prewar days have scrap exports topped a million tons.

GIFS ELECTS: C. H. Ker, president, Dalton Foundries Inc., Warsaw, Ind., was elected president of the Gray Iron Founders' Society at its annual meeting, Nov. 12. He succeeds Henry J. Trenkamp, president, Ohio Foundry Co., Cleveland. New vice president is J. W. Simmons Jr., secretary-treasurer, Cox Foundry & Machine Co., Atlanta. C. H. Meminger, manager, Foundry Division, Posey Iron Works Inc., Lancaster, Pa., was elected secretary and Walter O. Larson, president, W. O. Larson Foundry Co., Grafton, O., was re-elected treasurer. A report on the annual meeting will be presented in next month's issue.

DIE CAST MAGNESIUM: A hot chamber die casting process for magnesium has been developed by Dow Chemical Co. It will be licensed on a nonroyalty basis. Dow believes the process will make magnesium die castings "competitive with aluminum and zinc." The machine uses alloys in the 6 to 11 per cent aluminum range and produces castings up to 2 lb. Melt loss is said to be 12 per cent, compared with 20 per cent on cold chamber magnesium casting machines. Casting pressure is 3000 psi, same as with hot chamber zinc process, and casting temperature is 1180°F for 90 per cent of the work run.

NEW QUARTERS: American Foundrymen's Society formally dedicated its new headquarters in Des Plaines, Ill., Nov. 18. AFS President Frank J. Dost presided at the ceremonies in which about 200 members of the foundry industry participated. The beautiful new modern brick and concrete building provides 11,139 sq ft of space on one floor.

FOR SALE: Equipment of the Malleable Fittings Corp., 1040 West Lomita Blvd., Harbor City, Calif., will be sold at public auction Dec. 2. Previous attempts to sell the foundry as a going concern were unsuccessful.

COPPER SUPPLY: The U. S. annual supply of new copper will be increased by at least 25 per cent between 1952 and 1956, according to the Copper & Brass Research Association. This 300,000-ton addition will result from completion of expansion projects started by copper mining companies the last two year. Supplies also will be augmented by a higher recovery of scrap resulting from the increased consumption of copper.

Meanwhile copper supply has been pinched by mine and smelters strikes. To offset this the Office of Defense Mobilization has made an additional 25,000 tons of government-controlled

copper available to users. A total of 51,500 tons originally destined for stockpile now has been diverted for this purpose.

PERSONALS: O. H. Schildknecht has been appointed chairman of the executive committee, Maynard Electric Steel Casting Co., Milwaukee, and has been succeeded as sales manager by W. A. Chappie . . . Adm. Alan G. Kirk, chairman, Mercast Corp., New York, has been elected president, succeeding S. J. Sindeband . . . F. B. Barclay has been appointed works manager of General Steel Castings Corp's Commonwealth Plant, succeeding G. L. McMillin, now assistant vice president of Canadian Car & Foundry Co. Ltd. . . . Stowell C. Wasson, manager, Chicago area plants, National Malleable & Steel Castings Co., succeeds the late Walton L. Woody as vice president of operations.

OBITUARY: John F. Lacey, 56, vice president and general manager, Commercial Steel Casting Co., Marion, O., died Nov. 8 . . . Burtner Fleeger, president, Oklahoma Steel Castings Co., Tulsa, Okla., died Nov. 12 . . . G. G. Coolidge, 69, executive assistant to the president, Harbison-Walker Refractories Co., Pittsburgh, died Nov. 2 . . . Walter L. Deutsch, formerly sales manager, Columbus Malleable Iron Co., Columbus, O., and recently with Dayton Malleable Iron Co., died Oct. 10 . . . Hans J. Andersen, 55, assistant to the works manager, pattern shop, Allis-Chalmers Mfg. Co., Milwaukee, died Nov. 18 . . . William C. Frye, 77, former president of Chain Belt Co., Milwaukee, and a director of Sivyer Steel Casting Co., died Nov. 15.

MISCELLANY: Dow Chemical Co. has cut the base price of AZ91B magnesium die casting ingot 1 cent a pound; a new freight allowance brings the total reduction to about 2 cents . . . Continental Foundry & Machine Co. will machine all the hulls for the Army tanks in the $160 million armor contract awarded Chrysler Corp. Hulls will be cast by Continental and other steel foundries . . . October production of primary aluminum exceeded 125,000 tons, against 108,000 a year ago. Ten-month total exceeded that of 1953 by 17 per cent . . . Somerville Machine & Foundry Co., Somerville, Mass., has completed a 100,000-ft addition, increasing aluminum casting capacity 25 per cent.

PRICES OF FOUNDRY METALS AND COKE

(As of Nov. 26, 1954)

FOUNDRY COKE

(Per net ton, f.o.b. ovens)

BEEHIVE	
Connellsville	$16.50–17.00
OVEN	
Birmingham	$22.65
Buffalo	25.00
Chicago	24.50
Detroit	25.50
Erie, Pa.	25.00
Everett, Mass.	23.50
Indianapolis	24.25
Kearney, N. J.	24.00
Lone Star, Tex.	18.50
Milwaukee	25.25
Montreal, Que.	26.25
Painesville, O.	25.50
Philadelphia	23.00
Portsmouth, O.	24.00
St. Louis, del.	26.00
St. Paul	23.75
Swedeland, Pa.	23.00
Terre Haute, Ind.	24.05

PIG IRON

(Per gross ton f.o.b. furnace)

	No. 2 Foundry	Malleable
Bethlehem, Pa.	$58.50	$59.00
Birmingham	52.88	....
Buffalo	56.50	57.00
Chicago	56.50	56.50
Cleveland	56.50	56.50
Everett, Mass.	61.00	61.50
Fontana, Calif.	62.50	....
Geneva, Utah	56.50	....
Granite City, Ill.	58.40	58.90
Lone Star, Tex.	52.50	52.50
Neville Island (Pittsburgh)	56.50	56.50
Steelton, Pa.	58.50	59.00
Swedeland, Pa.	58.50	59.00
Toledo, O.	56.50	56.50
Troy, N. Y.	58.50	59.00
Youngstown, O.	....	56.50

NONFERROUS INGOT

(Cents per pound, carlots)

BRASS AND BRONZE: Red brass, No. 115, 29.50; tin bronze, No. 225, 41.00; No. 245, 34.75; high-leaded tin bronze, No. 305, 34.00; No. 1 yellow, No. 405, 25.25; manganese bronze, No. 421, 27.75.

ALUMINUM: 99 per cent plus, primary ingots 22.2. Secondary No. 12 alloy 20.25–20.75. Deoxidizing grades: No. 1 21.50–22.00; No. 4 18.50–19.00.

MAGNESIUM: 99.8 per cent notched ingots 27.75, f.o.b. Freeport, Tex. (10,000 lb or more).

COPPER: Electrolytic 30.00, delivered Connecticut valley.

ZINC: High grade 12.85, delivered. Die casting alloy 15.50, delivered.

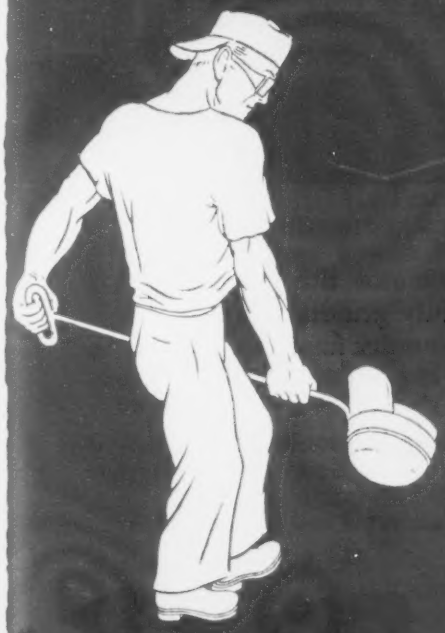
IRON AND STEEL SCRAP

(Consumer prices per gross ton delivered, except as otherwise noted)

	No. 1 Heavy Melting Steel	No. 1 Cupola Cast	Heavy Breakable Cast	Clean Auto Cast	Machinery Cast	Malleable	Short Steel Rails
Birmingham	$26.00–27.00	**$45.00–46.00	.....	.....	.....	.....	$40.00–41.00
Boston*	**22.00–24.50	**29.00–30.00	.....	.....	**32.00–33.00	.....	.....
Buffalo	31.00–32.00	**38.00–39.00	.....	.....	**43.00–44.00	.....	42.00–43.00
Chicago	33.00–34.00	39.00–40.00	.....	42.00–43.00	42.00–43.00	42.00–44.00	50.00–52.00
Cincinnati*	**30.00–31.00	**39.00	**36.00	.....	**45.00	.....	47.00–48.00
Cleveland	32.00–33.00	44.00–45.00	30.00–31.00	44.00–45.00	44.00–45.00	44.00–45.00	47.00–49.00
Detroit*	**27.00	**34.00	**25.00	**38.00	.....	**30.00	.....
Los Angeles	20.00	**42.00–44.00	.....	.....	.....	.....	.....
New York*	27.00–28.00	29.00–30.00	.....	.....	.....	.....	.....
Philadelphia	32.00–32.50	35.00–36.00	36.00–36.50	.....	42.00–43.00	43.00	.....
Pittsburgh	33.00–34.00	37.00–38.00	31.00–32.00	.....	42.00–43.00	.....	45.00–47.00
St. Louis*	30.00	40.00	29.00	41.00	.....	.....	46.00
San Francisco	24.00	43.00–46.00	36.00	39.00	48.00	.....	.....
Seattle	27.00	**32.00–35.00	**23.00	.....	.....	.....	.....

*Brokers' buying prices. **F.o.b. shipping point.

NOW Castings Are Completely Protected with Whitehead's Joint-Seal



- A ready-to-use plastic compound for perfect sealing
- Saves time, labor, storage space
- Cuts casting cleaning time
- Prevents run-outs and thick fins
- Really seals off core vents
- Gives a complete seal on dry sand molds
- Forms sealing gaskets for pouring basins and runner boxes
- Seals misfit and burned flask joints
- Seals down gate and sprue area on green sand molds
- Eliminates old soaking box; will not freeze
- Insures against leakers on pressure castings
- Balls easily for checking chaplet heights
- Can be applied with our special air gun

Whitehead Brothers COMPANY

Established 1841

NEW YORK OFFICE
324 West 23rd St., New York 11, N. Y.

NEW ENGLAND OFFICE
17 Exchange Place, Providence 1, R. I.

Manufacturers of:

LYQUAGRIP
Ready-to-use core paste

DOB-IT
Ready-to-use core mudding compound

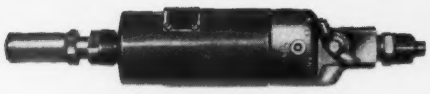
LYQUAFLOUR
For cleaner surface, better shake-out

LYQUAFACE
The liquid sand grain coating

Here is a new line of

CLECO HEAVY DUTY 2 INCH AND 3 INCH GRINDERS

No. 14 Series



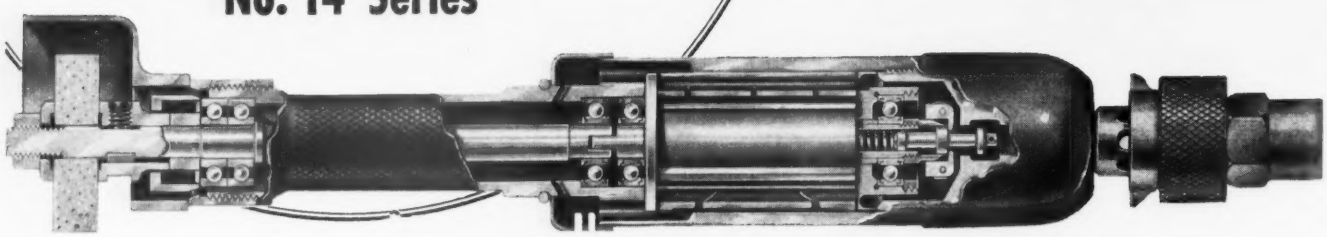
14G-90 GRINDER

14GQ-180 GRINDER

14GEQ-170 GRINDER

14GEQ-140 GRINDER

14GEL-140 GRINDER



Featuring a new, more powerful motor, this line of tools is excellent for heavy duty grinding on small castings and many other foundry finishing jobs. They may be used with cup wheels for close-quarter grinding.

They are fast, rugged and maintenance-free. Write us for a demonstration.

SPECIFICATIONS

Length	8 to 14½ inches, depending on style
Weight	2¾ to 4¼ lbs.
Free motor speed	9,000 to 17,000 rpm
Size wheel, max.	2 to 3 inches, depending on free motor speed
Type of throttle	Thumb, lever or Quick-As-Wink optional

CLECO AIR TOOLS

CLECO

DALLETT

Division of REED ROLLER BIT COMPANY

5125 Clinton Drive — Houston 20, Texas

AIR TOOLS AND ACCESSORIES

Grinders • Sanders • Rotary Drills • Riveters • Backfill Tampers
Chippers • Scaling Tools • Nut Runners • Impact Wrenches
Screwdrivers • Sump Pumps • Paving Breakers • Spike Drivers
Air Line Accessories and Fittings

5063-A

MICHIGAN *bucket control means "Bigger Loads . . . . . FASTER"*

Watch a MICHIGAN Tractor Shovel at work —with particular attention to bucket action —and you'll *see* how a MICHIGAN* will *handle bigger loads, move more yardage*—faster, at considerably lower cost.

- *Tremendous break-out power*—ram the cutting edge into any tough, hard-to-dig clay, shale or loose rock—and *work the bucket* to loosen it
- *Bucket roll-back at ground level*—pick up and transport full buckets at low center of gravity for safe traveling, no void space in the bucket; more work in less time
- *Remarkable digging ability*—two large double acting cylinders on bucket and two large double acting cylinders on main lift give excellent control and superior digging action.
- *Good bucket height and reach*—high dumping clearance and ample forward reach make trucks easy to load.

Check these outstanding Quality Features of MICHIGAN* Tractor Shovels . .

1. Superior Bucket Action—bigger loads, faster loading

2. Clark Power-Shift Transmission—faster operating cycle gets more yardage

3. Clark Torque Converter—3-to-1 torque multiplication; *power when needed*—no conventional clutch

4. Clark Planetary Axle—relieves torque load on shafts and gears, prolongs machine life

5. Power Steering—much easier handling, lessens driver fatigue

6. Gas or Diesel—right power for the job; more horsepower than any comparable machine

Six models: capacities from 1 5 cubic feet to 2 ¼ cubic yards. Facts about the MICHIGAN Tractor Shovel are important—and interesting. The MICHIGAN Fact Folio contains specifications and action photos. The coupon gets it for you.

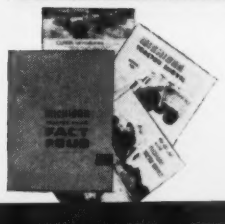
**A Trademark of Clark Equipment Company*

CLARK EQUIPMENT

16A

CLARK EQUIPMENT COMPANY
Construction Machinery Division
442 Second Street, Benton Harbor, Michigan

Please send the MICHIGAN Tractor Shovel Fact Folio

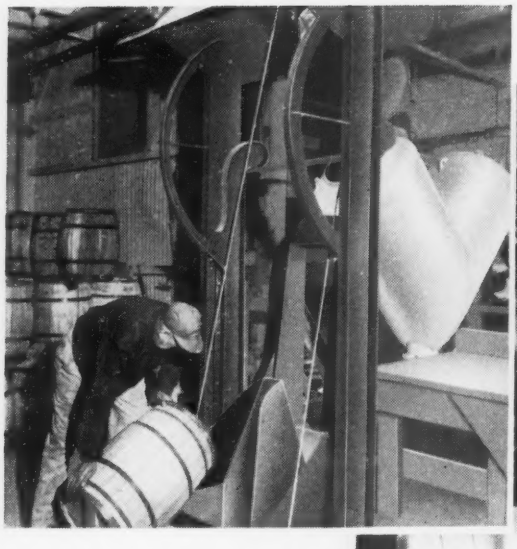


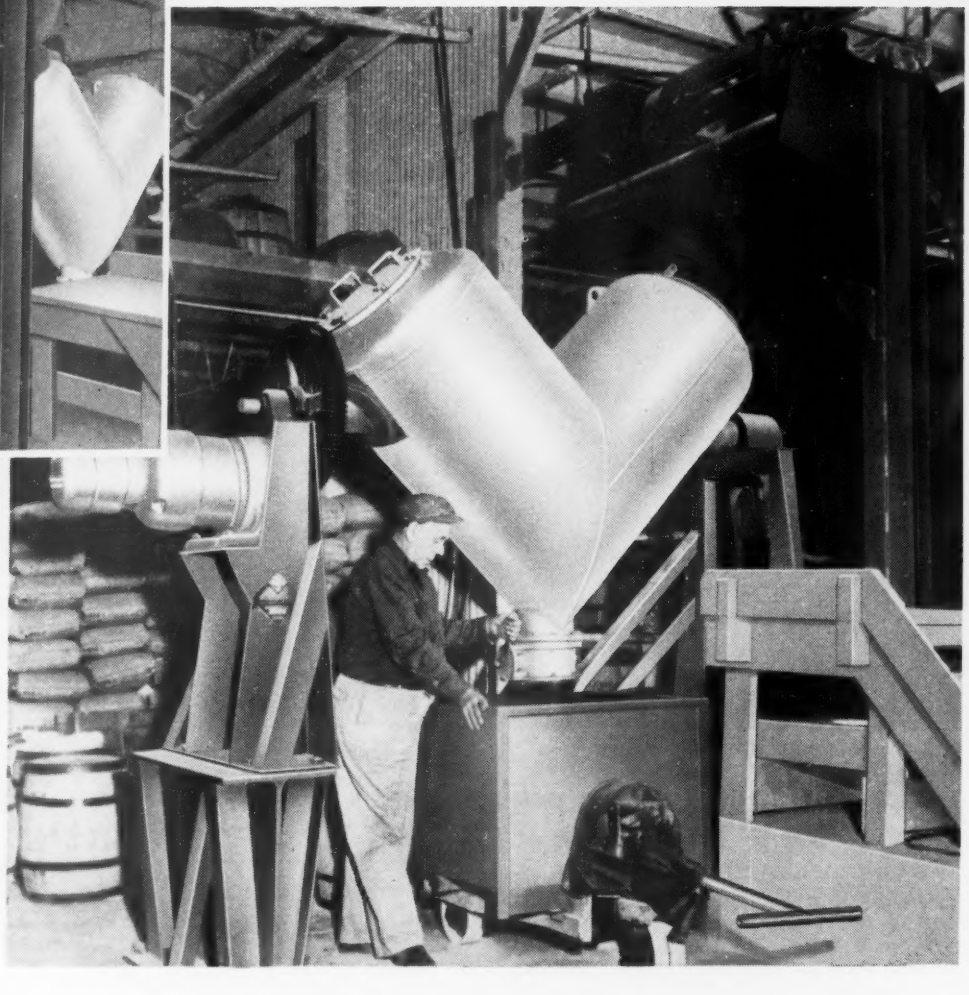
Name_____ Title_____

Firm_____

Address_____

City_____ County_____ State_____





Loading and unloading a blender can be easy when it's correctly designed. Above, a worker at Precision Grinding Wheel Co., uses a skip hoist to load a p-k twin shell blender of 20 cu. ft. capacity. At right, after mixing, he opens a valve to discharge the perfectly blended mass into a mobile hopper. The smooth interior of p-k blenders are entirely free of obstructions to allow easy discharge and cleaning.

Precision Blending 3 TIMES FASTER

Another cost-conscious manufacturer cuts operating and maintenance expense by mixing abrasives in a p-k twin shell blender

A thorough, uniform blend of abrasive grains is essential if the grinding wheels are to perform properly. That's why mixing those particles formerly took 15 minutes per batch in a conventional mixer.

Today, with a new p-k twin shell blender, that time has been cut from 15 minutes to 5, and an even more uniform blend results.

But that's not all. Precision Grinding Wheel Co., Inc., Philadelphia, reports wear and tear drastically reduced, too. Where critical parts of other mixers were always wearing out, the p-k twin shell just keeps rollin' along. The answer is in p-k's gentler, rolling-folding action which keeps abrasion of the grains to a minimum, while retaining grain cutting effectiveness and size. Easier charging and discharging, too . . . and hardly ever any cleaning. Taken all-in-all, this p-k user has found that . . .

As in plant after plant, the p-k twin shell blender does the job better, faster, and lasts longer. And that's natural, for p-k has been pioneering new design in all three basic blenders.

Let us make some free blending tests on your material, and report the results . . . Chances are we can save some money for you, too. For complete information write for p-k catalog #13.

The Patterson-Kelley Co., Inc.

1410 Lackawanna Ave., East Stroudsburg, Penna.

2524

101 Park Avenue, New York 17 • Railway Exchange Building, Chicago 4 • 1700 Walnut Street, Philadelphia 3 • 96-A Huntington Avenue, Boston 16 • and other principal cities

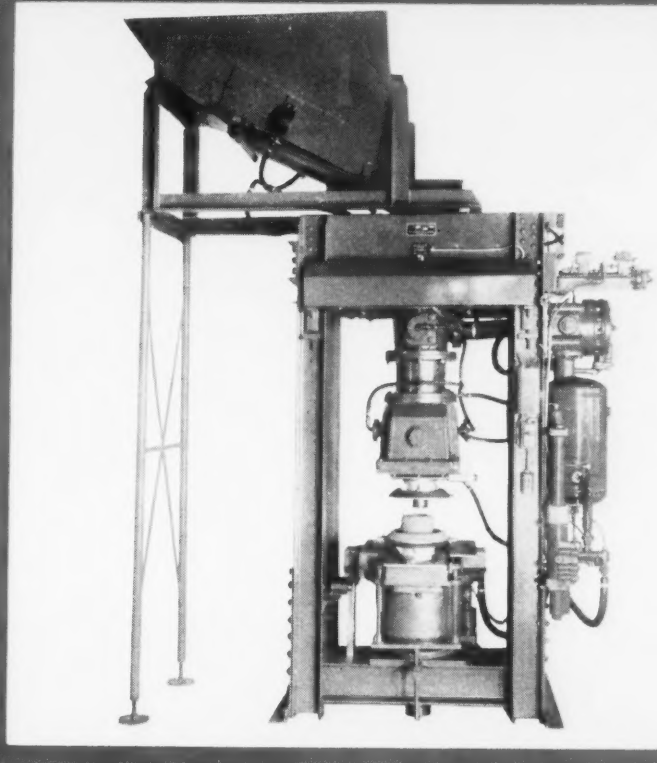
Our Sales Story is Simp...

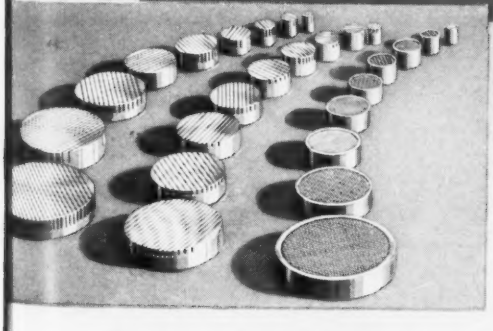
Demmler

Core Blowers hold the record for BOTH:

1. Highest Production

2. Lowest Maintenance





Demmler is the best source, too, for precision core box vents. Brass slotted, steel slotted and screen types for every application, including the new D-process.

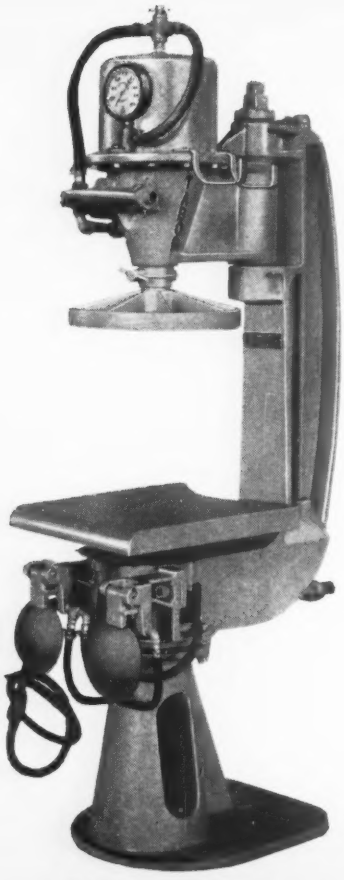
For core blowers, remember this: You cannot buy faster production, lower maintenance than Demmler's. The reasons are 1. Demmler-simplified design with all parts easily accessible, and 2. More rugged Demmler construction. The Demmler 100 Series is typical. On a defense project, these machines blew 2,000 cores per hour! And, many case histories show that they require only a fraction of the usual maintenance. The Model 103 shown above has electric-motor-driven mechanical sand agitator. And, it will blow ANY core or molding sand required in the foundry!

Write for literat...

TABOR

TRADE 1884 MARK

goes to



Tabor Jar Top Squeezer

Tabor, a famous name in foundry equipment for 70 years, has become a division of Turbo Machine Company.

Here's what this development means to you:

— the complete line of Tabor Molding Machines, Cut-Off Machines, Nibblers and other equipment will be manufactured in a modern plant known for precision work.

— sales and service will be provided by Tabor's well-known staff of sales engineers, including: A. C. Eastwood, J. McMullin, H. H. Reich, P. J. Shire, R. J. Shire, E. L. Tuck, Ray Wiehsner and Ray Wiehsner, Jr. . . . plus the same manufacturer's representatives who have served you so well

— product improvement will be a continuing objective. Quality will continue to be the watchword in Tabor equipment.

If you want to talk to a Tabor sales engineer about the production-proved equipment illustrated here, a call or a letter will bring him to your desk. Or ask for the complete Tabor Catalog.

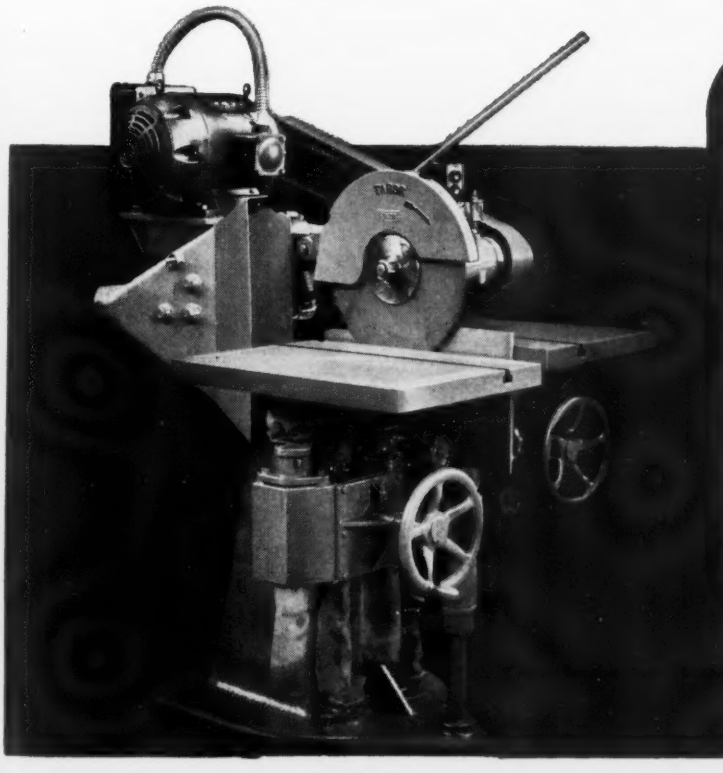
TURBO

The company behind the machine

The TABOR TRADE 1884 MARK *Manufacturing Co.*

DIVISION OF

TURBO MACHINE COMPANY, LANSDALE, PA.



TURBO MACHINE COMPANY ***manufactures***

Drying, heat-setting and processing machinery for a wide variety of industries

Spontane Steam Cleaner

Dura-Mil Liquid Filler

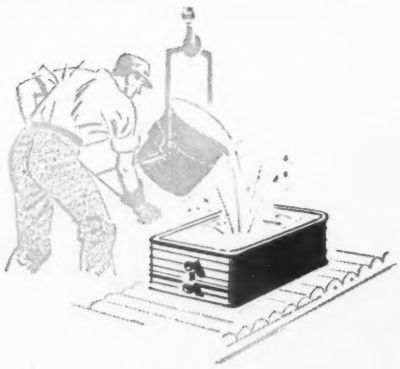
Kenro Ice-Cream Bar Machine

FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION INC. MEMBER FEMA

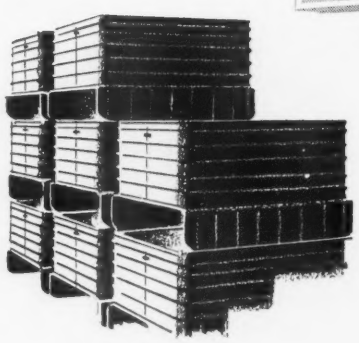
Republic Steel
Flasks, Boxes, Skids, Pallets

For Efficiency in

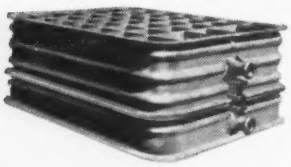
Molding



Moving

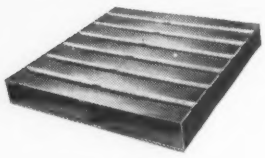


and Storing Operations

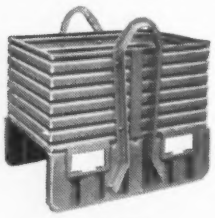


CH-40
Crane Handling Flask

OM-1
Light Weight Flask



P-14
Double-face Steel Pallet



PB-129
Box and Skid Unit with
Special Tiering Device

REPUBLIC STEEL FOUNDRY FLASKS speed efficiency through ease of operation, ease of handling and through long, trouble-free service. Republic Flasks are designed and built to meet the needs of the individual job. Each cope, cheek and drag is welded into one integral piece of steel, ribbed and flanged to provide strength and rigidity.

REPUBLIC STEEL BOXES, SKIDS AND PALLETS keep production lines running smoothly, help speed movement of materials after molding, conserve storage space, produce savings in all phases of materials handling. Republic Boxes, Skids and Pallets can be made in a wide range of sizes to meet the requirements of the individual job. Republic Boxes, Skids and Pallets can be used in combination with power lift-trucks, cranes and hand-operated units.

Republic Engineers are available for consultation on materials handling and flask problems. There is no cost or obligation for this service.

REPUBLIC STEEL CORPORATION
Pressed Steel Division
6208 Truscon Avenue, Cleveland 27, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

REPUBLIC STEEL

REPUBLIC
MATERIALS HANDLING EQUIPMENT

6,000-r.p.m. wheel speed is "stopped" by 1/10,000 sec. stroboscopic exposure. (Wheel guard removed to show detail.)

Watch rough grinding problems melt away fast, *safely*...when a CARBOFLEX Depressed Center Wheel goes to work. Undercut and reduce heavy welds, rough off fins and sharp edges, notch and cut off gates and risers, remove surface defects. Breeze through *any* general purpose roughing, slotting or cut-off operation in record time...with maximum safety. CARBOFLEX Wheels by CARBORUNDUM combine extreme high strength and resistance to cracking with maximum cutting ability...give you more production at less abrasive cost. Both sides of these strong, fabric-reinforced wheels are knurled. Cut with either side plus the edge. Call your CARBORUNDUM Distributor or Salesman today for a demonstration of this new cost-cutter.

Through application "know-how" and product quality

CARBORUNDUM

REGISTERED TRADE MARK

continually puts more sense in your abrasive dollar

Lift with AIR

GET THESE ADVANTAGES

CONTINUOUS SERVICE
without injury to motor

CAN'T BURN OUT
from being stalled

CAN'T OVERHEAT
from rapid reversals

NOT AFFECTED
by dust or fumes

THAT ALL ADDS UP TO

LOWER MAINTENANCE

plus

CONTROLLED SPEED
variable from 0 to 17 fpm

LIGHT WEIGHT
1,000 lb hoist weighs 28 lb

300, 1,000 and 2,000 lb capacities

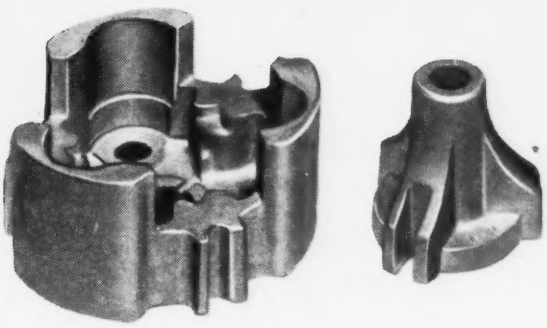
KELLER AIR HOISTS

KELLER TOOL COMPANY • 1323 FULTON ST., GRAND HAVEN, MICH.

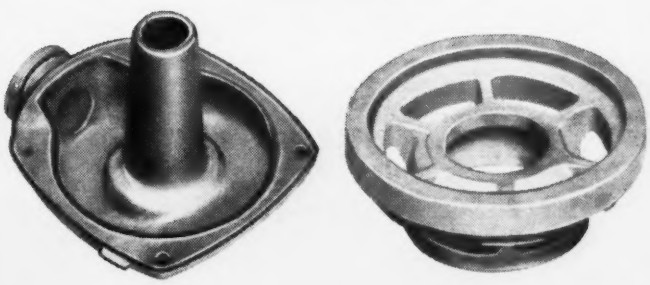
RESINOX

for shell molding... your key to cost and quality control!

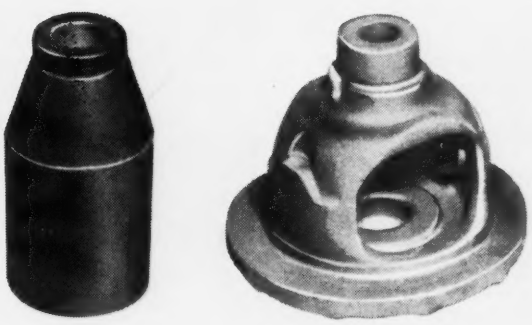
Uniform quality...



Better finish...



Lower reject rate...



Closer tolerances...

It's a fact that shell molding can give you castings with more uniform quality, better finish, lower reject rate and closer tolerances than the green sand method.

But, there are important differences in shell molding resins. No one resin can meet all foundry molding requirements – that's why Monsanto research has developed three different resins to meet special foundry needs:

RESINOX 714 – For fastest pick-up and fastest curing cycle.

RESINOX 736 – A general all-purpose resin for fast pick-up, high rigidity and strength.

RESINOX 1128 – For deep-draw problems; produces shells of high rigidity and superior strength. Specifically developed to meet a wide range of varying shop conditions and casting problems.

Today, the progress is toward resins which show high rates of pick-up and cure without any sacrifice in other desirable properties, such as good hot strength and even cure. That's why the nation's leading foundries specify Monsanto's Resinox shell molding resins – they're research-proved and shop-tested.

Continuing technical research in Monsanto's laboratories promises still further improvements in foundry resins. For the *latest* data on resin products and processes for the foundry industry, write MONSANTO CHEMICAL COMPANY, Plastics Division, Room 5711, Springfield 2, Mass.

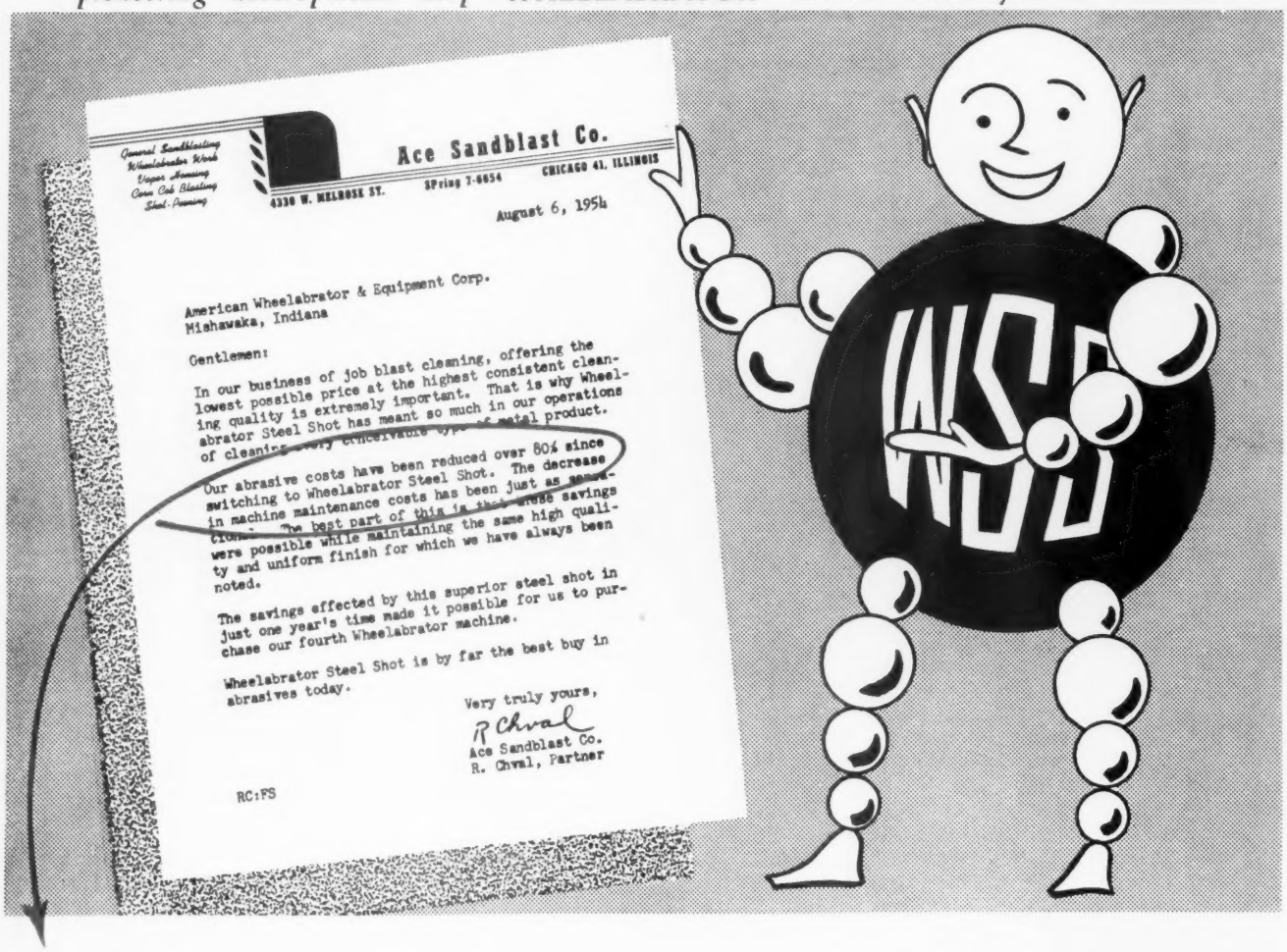
Resinox: Reg. U. S. Pat. Off.

Meet more Monsanto products on CBS-TV's "Morning Show"

MONSANTO

SERVING INDUSTRY... WHICH SERVES MANKIND

pioneering developments keep **WHEELABRATOR®** *STEEL SHOT first in abrasives*


Ace Sandblast Co.
4330 W. MELROSE ST.
SPring 7-6654
CHICAGO 41, ILLINOIS
August 6, 1954
American Wheelabrator & Equipment Corp.
Mishawaka, Indiana
Gentlemen:
In our business of job blast cleaning, offering the lowest possible price at the highest consistent cleaning quality is extremely important. That is why Wheelabrator Steel Shot has meant so much in our operations
Our abrasive costs have been reduced over 80% since switching to Wheelabrator Steel Shot. The decrease in machine maintenance costs has been just as
were possible while maintaining the same high quality and uniform finish for which we have always been noted.
The savings effected by this superior steel shot in just one year's time made it possible for us to purchase our fourth Wheelabrator machine.
Wheelabrator Steel Shot is by far the best buy in abrasives today.
Very truly yours,
Ace Sandblast Co.
R. Chval, Partner
RC:FS

"Our Abrasive Costs Have Been Reduced Over 80%"

Ace Sandblast Co. Gets Highest Quality Cleaning at Lowest Price with Wheelabrator® Steel Shot

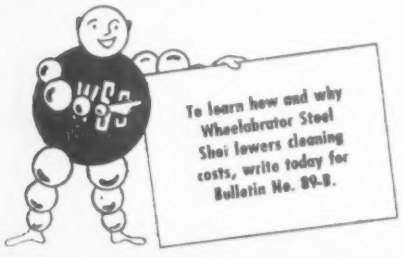
In the highly competitive jobbing blast cleaning business, customer acceptance of uniform surface cleanliness at just the right price makes the difference between success and failure. That's why Ace Sandblast Co., one of the largest and best equipped job cleaning shops in Chicago, sings such high praises for Wheelabrator Steel Shot.

Their prices are right and finish quality is uniformly perfect with their unbeatable combination of Wheelabrator airless blast equipment and Wheelabrator Steel Shot. Each of their four Wheelabrators is operating with this superior electric furnace steel shot.

Since switching to Wheelabrator Steel Shot, abrasive costs have been slashed 80%, the decrease in machine maintenance costs has been equally sensational. These savings enabled them to purchase an additional Wheelabrator making it possible for them to widen the scope of their cleaning activities.

This is the kind of report we're getting every day from users. It's not surprising. Wheelabrator Steel Shot is a proved money maker for every blast cleaning operation.

If you want to reduce your cleaning costs you ought to know more about Wheelabrator Steel Shot. Let us make a survey of your blast cleaning operations (no obligation, of course) — there's a Wheelabrator engineer nearby who is prepared to study your problem and recommend the SAE size Wheelabrator Steel Shot for your needs. Write today for details.



American
WHEELABRATOR & EQUIPMENT CORP.
505 S. Byrkit St., Mishawaka, Indiana

WHEELABRATOR STEEL SHOT

the starting point

for better castings at lower cost...

COLEMAN OVENS

The only complete line of Core and Mold Ovens made in every type for every method to fit YOUR requirements BEST!

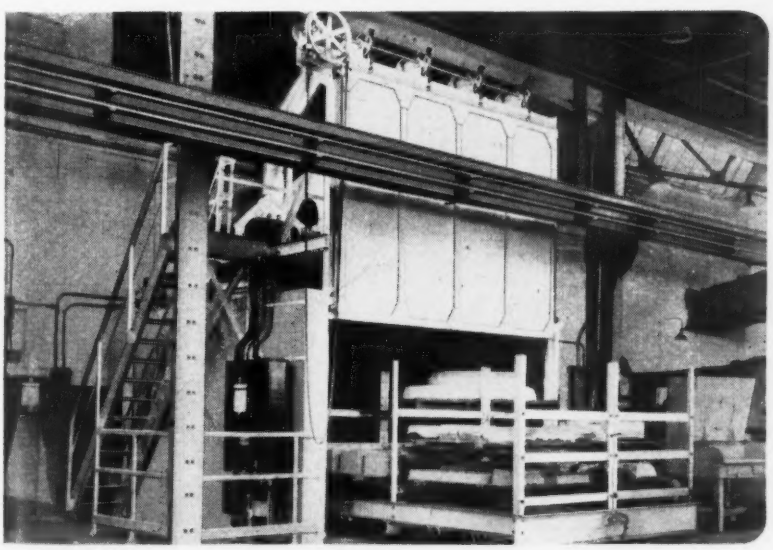
For better quality castings... for immediate savings in labor, materials and fuel, for consistently uniform baking of cores and molds at lower cost, install Coleman Ovens. Large and small foundries find Coleman Ovens are essential in producing castings to meet the most exacting specifications.

Performance records prove that Coleman Ovens may reduce overall core department costs by as much as 50%. Such savings mean increased profits and rapid amortization of the oven cost. Many Coleman Ovens have paid for themselves in less than a year!

Coleman Core and Mold Ovens provide exclusive features resulting from over 50 years of specialization in the design and construction of foundry ovens and over 10,000 installations in leading foundries. *As builders of the world's only complete line of foundry ovens, we have no reason to recommend any but the oven best suited to your requirements.*

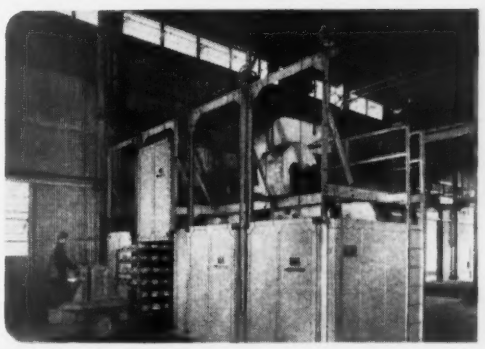
Experienced Coleman Engineers are ready to help you with your foundry oven needs without obligation. Now, with production savings so important it will pay you to investigate the unusual advantages of Coleman Ovens.

Write today for Bulletin 54

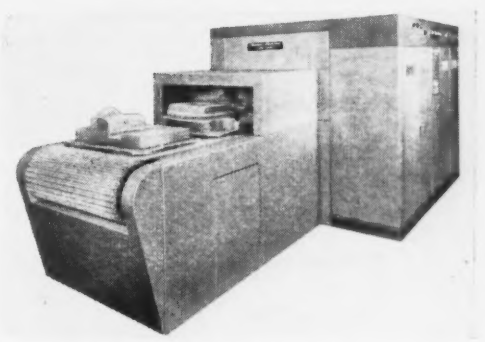


Coleman Car-Type Oven

Coleman Tower Oven



Coleman Transrack Ovens



Coleman Dielectric Core Oven

A COMPLETE RANGE OF TYPES AND SIZES...

for every core baking and mold drying requirement:

Tower Ovens • Horizontal Conveyor Ovens
Car-Type Core Ovens • Car-Type Mold Ovens
Transrack Ovens • Rolling Drawer Ovens
Portable Core Ovens • Portable Mold Dryers
Dielectric Core Ovens

THE FOUNDRY EQUIPMENT COMPANY
1821 COLUMBUS ROAD **CLEVELAND 13, OHIO**

MEMBER FEMA

WORLD'S OLDEST AND LARGEST FOUNDRY OVEN SPECIALISTS

THE FUNCTION OF THE KNIGHT ORGANIZATION IS TO PROVIDE COMPREHENSIVE PROFESSIONAL ENGINEERING SERVICES—

Foundry Engineering
•
Architectural Engineering
•
Construction Management
•
Organization
•
Management
•
Industrial Engineering
•
Wage Incentives
•
Cost Control
•
Standard Costs
•
Flexible Budgeting
•
Production Control
•
Modernization
•
Mechanization
•
Methods
•
Materials Handling
•
Automation
•
Survey of Facilities

KNIGHT ENGINEERS assist you in analyzing your operations, establishing and carrying out a program to increase unit or total production at lower costs.

The Knight organization is not interested in the sale of any equipment.

EVIDENCE OF EXPERIENCE

Lester B. Knight & Associates, Inc.

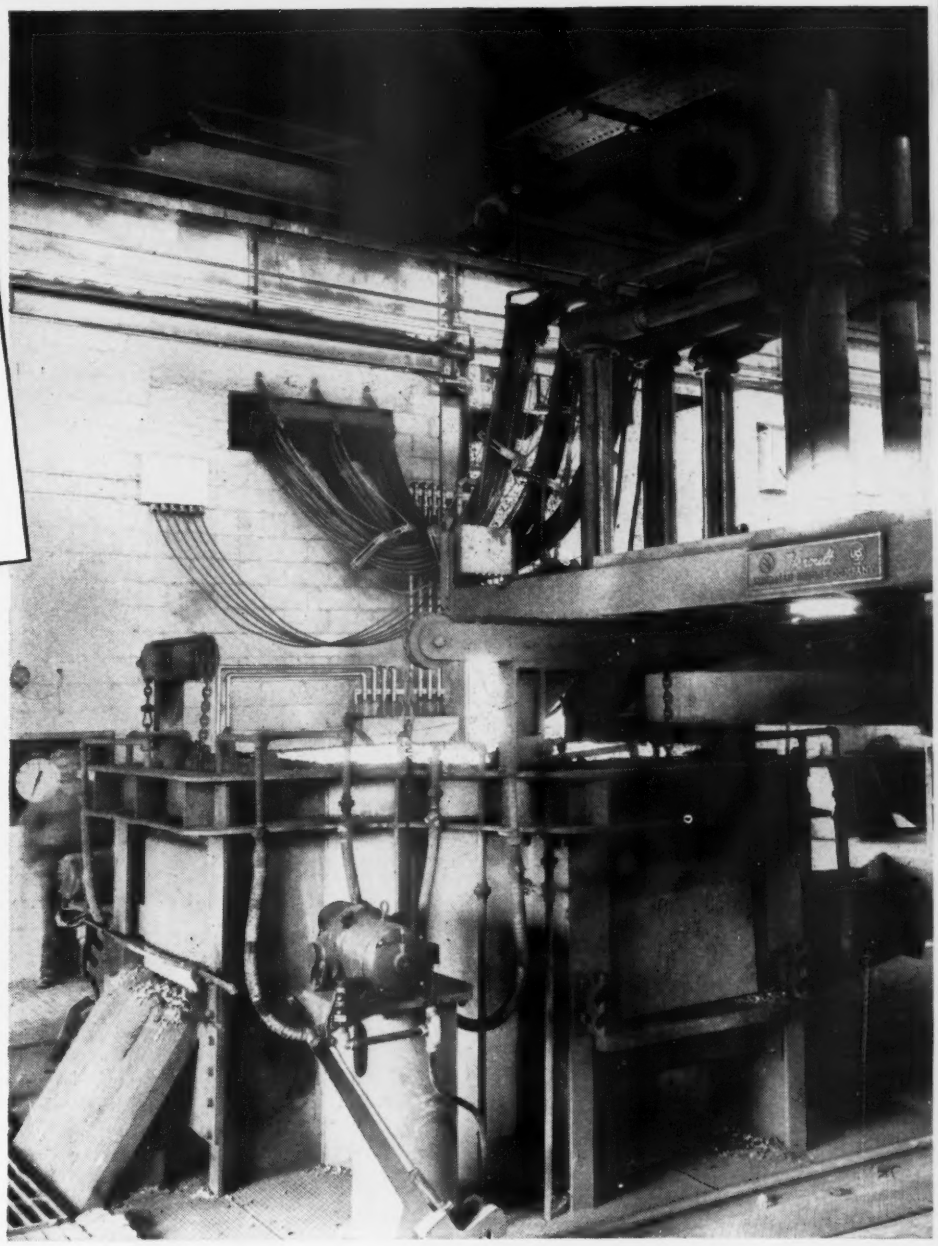
Consulting Engineers

MEMBER OF THE ASSOCIATION OF CONSULTING MANAGEMENT ENGINEERS, INC

600 W. Jackson Blvd., Chicago 6

917 Fifteenth St., N. W., Washington 5, D. C. • Lester B. Knight & Associates, 50 Church St., New York 7

Heroult
ELECTRIC MELTING FURNACES



The high production capacity of the Heroult makes it the foundryman's favorite furnace!

NEW CATALOGUE
Now Ready

Contains up-to-date information on Heroult Electric Melting Furnaces – types, sizes, capacities, ratings, etc. For free copy, write to our Pittsburgh office.

AVAILABLE in foundry sizes with either Gantry or swing-type roof, these widely used furnaces are equipped with the latest time- and labor-saving mechanical devices and electrical controls. They are noted for their efficient performance, low operating and maintenance costs.

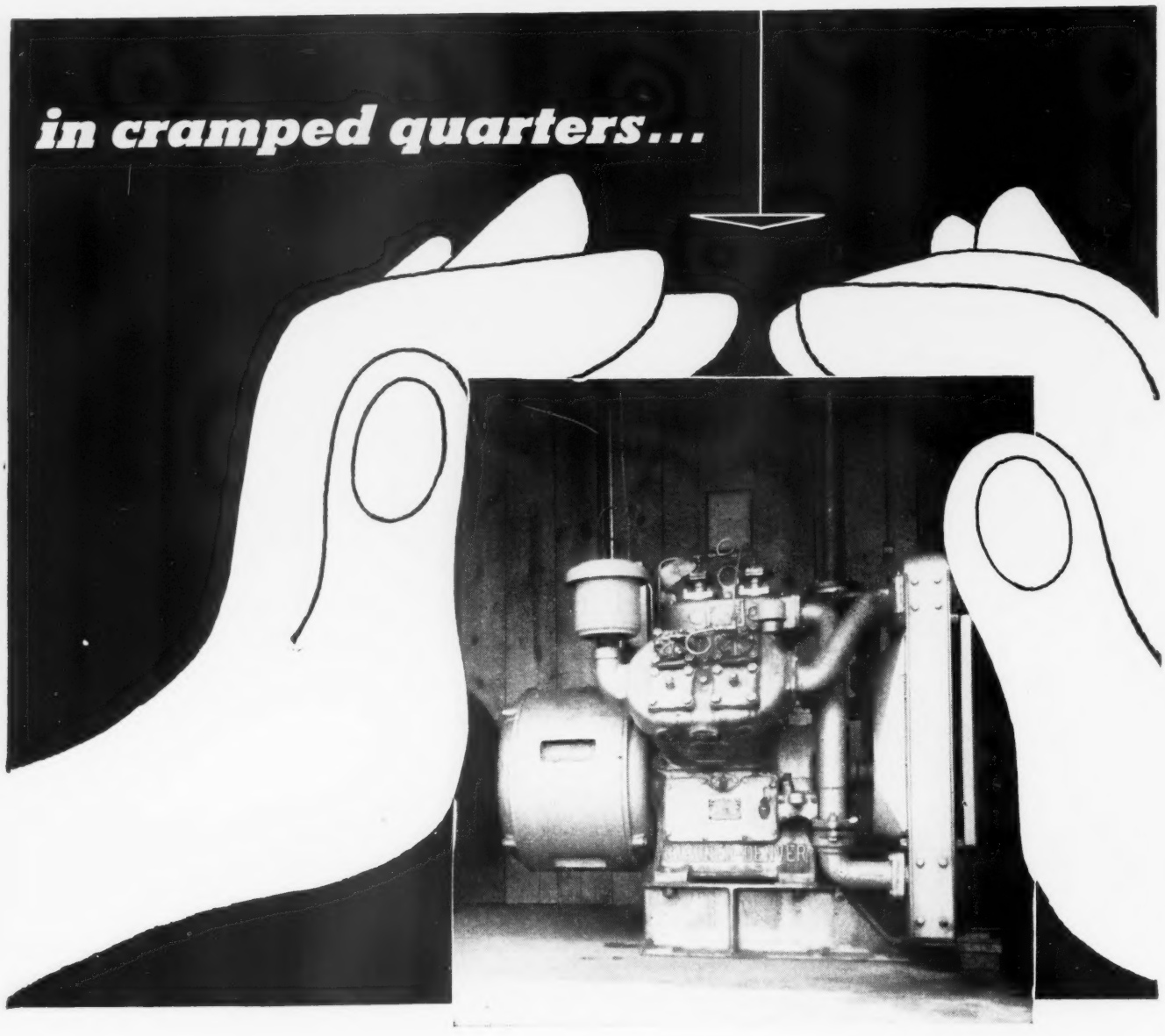
We welcome an opportunity to help you select and install the foundry furnace best suited to your requirements.

AMERICAN BRIDGE DIVISION, UNITED STATES STEEL CORPORATION
GENERAL OFFICES: 525 WILLIAM PENN PLACE, PITTSBURGH, PA.

Contracting Offices in New York, Philadelphia, Chicago, San Francisco and other principal cities.
United States Steel Export Company, New York

USS

UNITED STATES STEEL

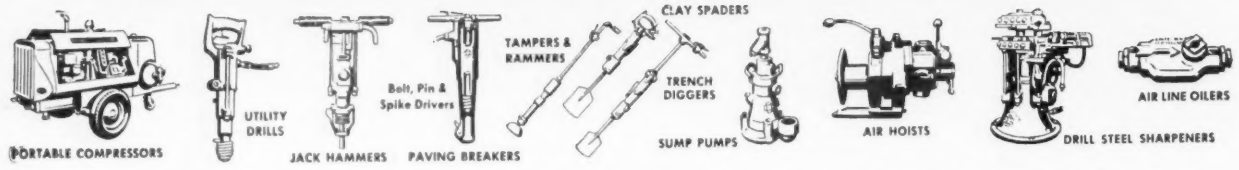


..IT'S THE PACKAGED GARDNER-DENVER WB COMPRESSOR

compact and competent
easily and quickly installed
Seven sizes fully described in Bulletin WB-10. Write today.

SINCE 1859

GARDNER-DENVER



THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS
FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd. 14 Curity Avenue, Toronto 16, Ontario

NOW—

these cores dry in 1⅓ minutes ...INSTEAD OF 60!

This is typical of the time savings you can make with a *Foundromatic* core dryer! This unit dries cores in only a small fraction of the time required in conventional ovens . . . literally cuts drying time from hours to minutes.

The method is not only amazingly fast, but core quality is actually improved. Cores have a smooth finish and superior shakeout characteristics.

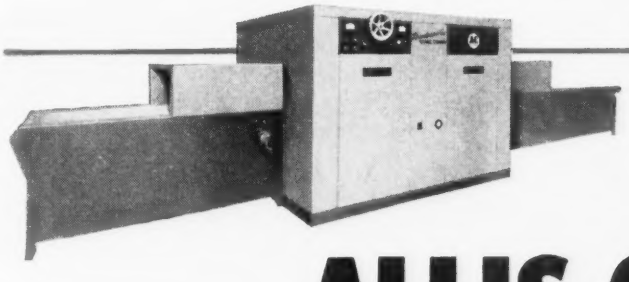
Using a *Foundromatic* dryer, it is no longer necessary to make cores ahead of time and build up a stock. Cores are not only dried fast, but come out of the dryer cool enough to handle bare handed, and ready to use.

60% SAVING IN HEAT COSTS

There's no waste heat! All heat goes into core. If there are no cores between electrodes, no energy is wasted. Result: low costs . . . no heat, smoke, fumes in core room.

Find out more about this modern core drying. Call your nearby Allis-Chalmers district office, or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-4346

Foundromatic is an Allis-Chalmers trademark.



Get This Bulletin!
It is full of facts on dielectric sand core drying. Ask for 15B7306B.

ALLIS-CHALMERS

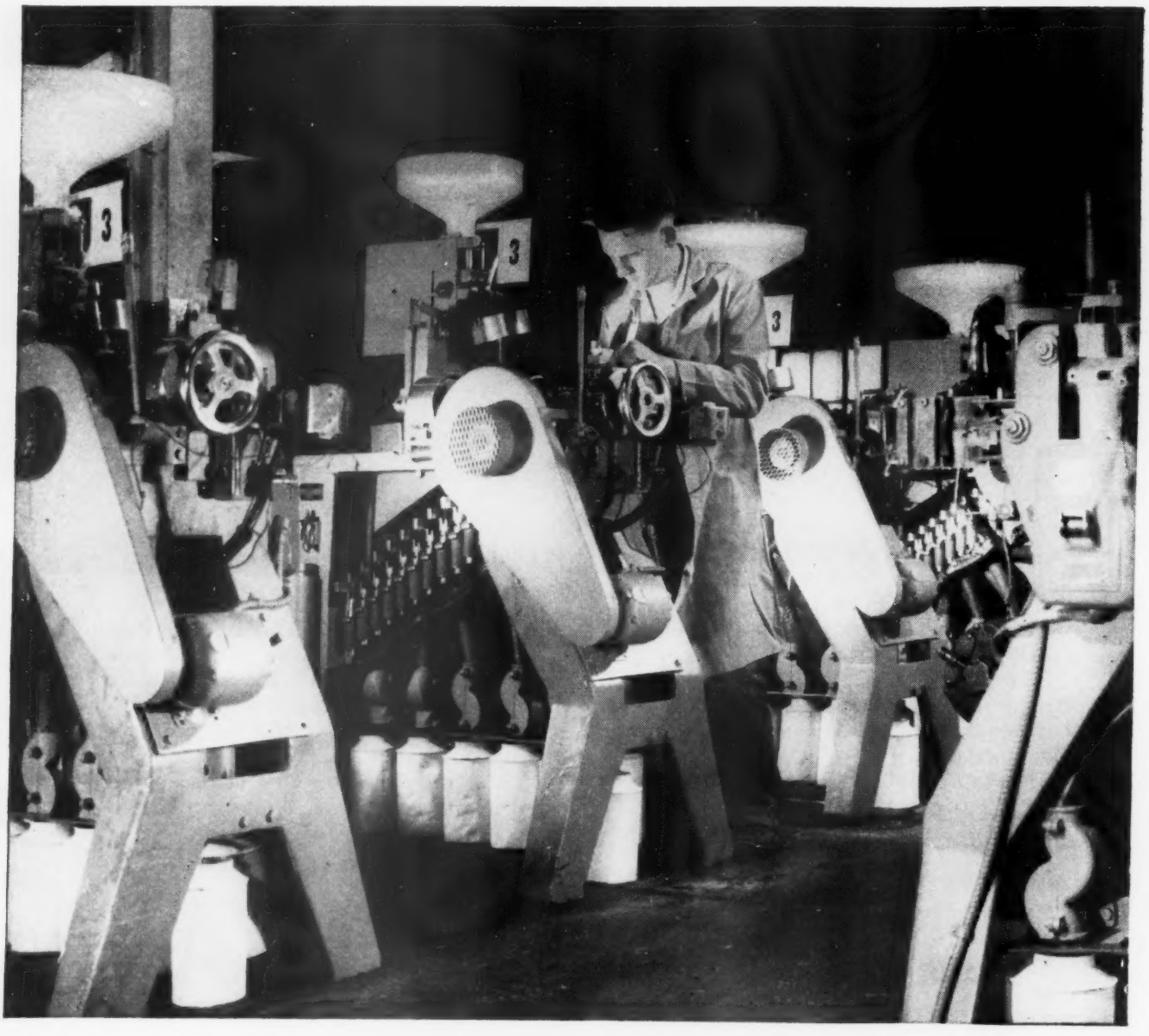
In each and every bearing, we match rollers to almost microscopic limits

NOT satisfied to finish rollers to extremely close tolerances, Timken Company engineers designed the special machines you see pictured below. They sort rollers into even more precise sub-sizes so we can match the rollers in *each* and *every* bearing to almost microscopic limits. Result: each roller carries the same load, assuring quieter operation, longer life.

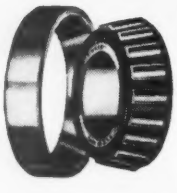
This is typical of the many extra steps we take to give you more for your money than any other bearing manufacturer. In fact, only with Timken® bearings do you get *all* these advantages: advanced design, precision manufacture, rigid quality control, special analysis Timken steels. The end result is that every Timken bearing insures longer life, reduces friction and cuts maintenance costs to a minimum.

Whether you're buying or building machinery, specify Timken bearings. Or if you're replacing bearings, insist on Timken tapered roller bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

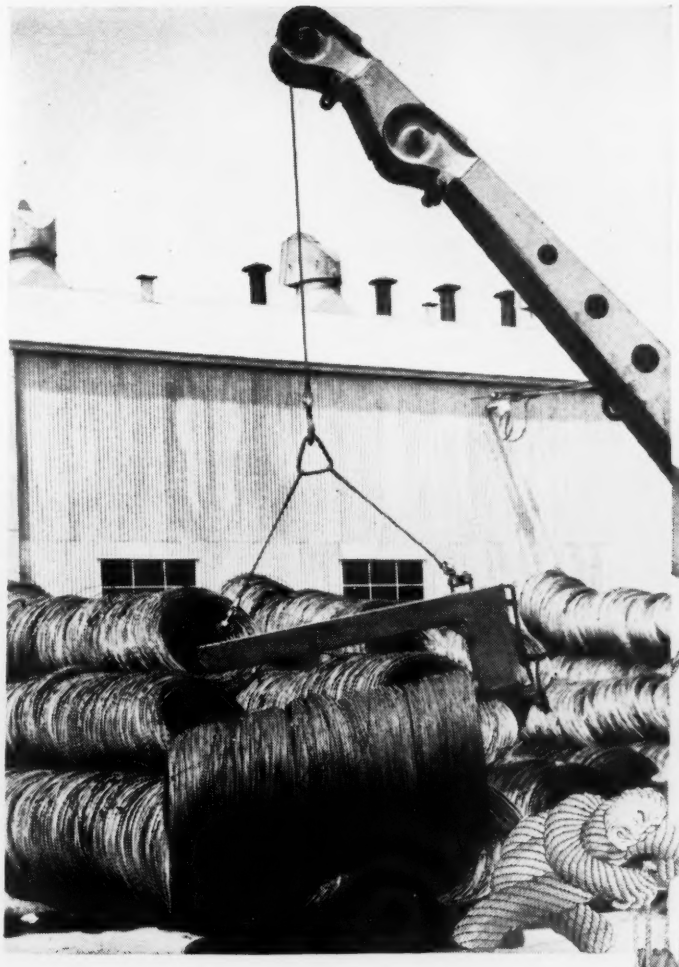
This symbol on a product means its bearings are the best.



TIMKEN
TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ○ THE TIMKEN TAPERED ROLLER ○
BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION



Do Your Worst To This FREE Tuffy® SLING

Tuffy® HOIST LINE

Here's A Twin To Tuffy Slings that's specially designed to match their strength and wearability! Tuffy Hoist Line gives you more safety from drum to sling and built-in service life to handle more loads.

No Chance For Ordering Mixups because there are no complicated specifications! Just tell your distributor the length, diameter and "Tuffy Hoist Line." Try Tuffy, whether you use overhead, stiff leg or mobile cranes, derricks or clamshells!

Your Tuffy Distributor Stocks Against Your Requirements

When You Need Replacement Rope, you often need it *fast.* And that's where your Tuffy distributor comes in handy. Give him an idea of your requirements and he will stock ahead of your replacement schedules from his nearby mill depot. Give him a call now!

You Prove How Tough Tuffy Slings actually are . . . to your complete satisfaction . . . with the 3-ft. Tuffy Sling we give you! We're convinced you'll say it's stronger, more flexible, more economical than any sling you've ever used. Here's why:

Tuffy Slings Are Made in a 9-part machine-braided wire fabric construction that's extra flexible to resist kinking. If you do succeed in putting a kink in it, see how easily your Tuffy Sling straightens out with *no material damage.*

Proof-Test Tuffy Up To Twice its rated working load. Prove to yourself that Tuffy Slings are the toughest in the business!

TEAR OFF AND MAIL COUPON NOW

Union Wire Rope Corporation
2280 Manchester Ave., Kansas City 26, Mo.

At no cost or obligation to me, please rush the material I have checked:

- ☐ FREE 3-Ft. Tuffy Sling!
- ☐ FREE Sling Handbook and Rigger's Manual, Featuring 12 Tuffy Factory-Fitted Types!
- ☐ Name and Address of Tuffy Distributor Nearest Me!

FIRM NAME_____

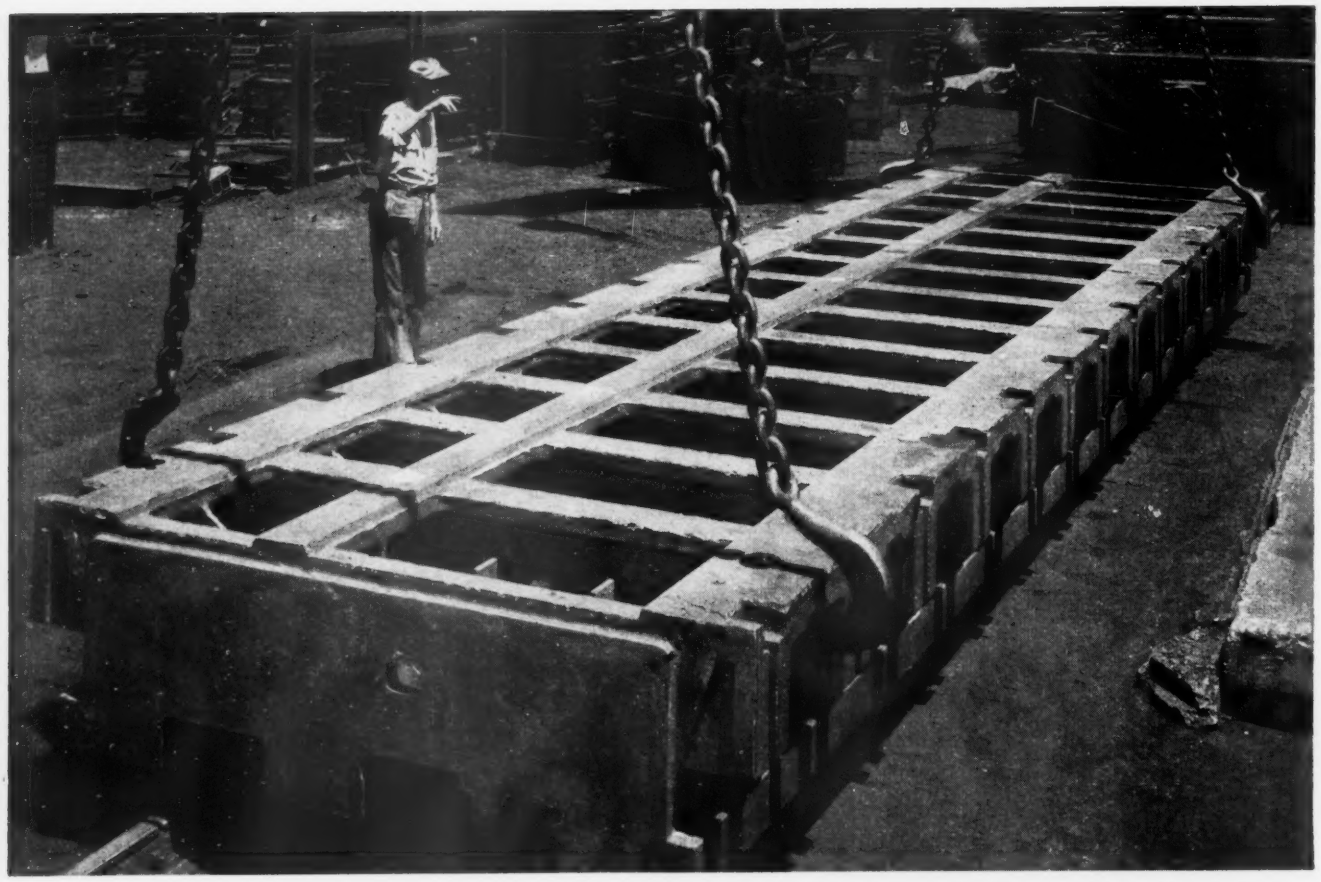
BY_____ TITLE_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

union Wire Rope **corp.**

Specialists in High Carbon Wire, Wire Rope and Braided Wire Fabric



QUALITY CASTING—All interior and exterior surfaces of this 56,000 pound iron casting were poured against Truline-bonded cores. Lack of erosion, scabs, and buckles, and smooth appearance of semi-finished casting demonstrates Truline's ability to do the job.

QUALITY CASTINGS FROM TRULINE®-BONDED CORES

(PHOTOS COURTESY ELYRIA FOUNDRY CO.)

Quality castings begin with quality cores. That's why more and more foundries are turning to Truline for cores strong enough to resist the erosive tendencies of poured metal, yet collapsible enough to produce crack-free castings.

In the core room, in the molds, and in the cleaning room, the use of fast-baking Truline Binder means more efficient and economical operations.

Your Truline Binder serviceman will be glad to assist you in formulating your core sand mixes for quality castings. Write:

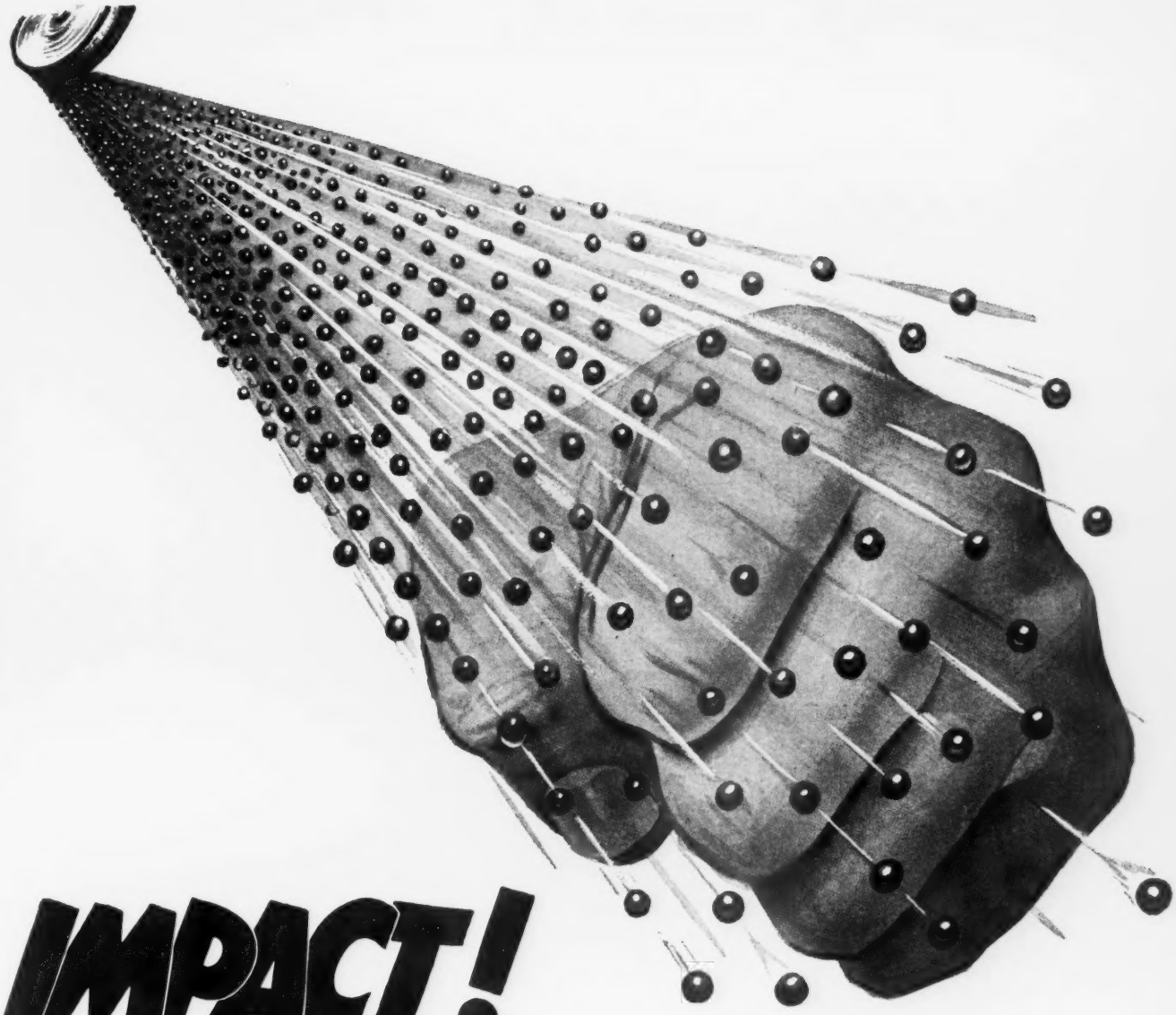
Naval Stores Department

HERCULES POWDER COMPANY

920 King St., Wilmington 99, Del.

QUALITY CORES—Truline binder was used in making this core-mold for the casting pictured above.

NF54-3



IMPACT!

MALLEABRASIVE . . . SHOT OR GRIT . . . is *packed* with blast cleaning power for profitable operation.

Because Malleabrasive is scientifically heat-treated and laboratory-controlled it does a *better, faster* cleaning job. And because it cleans quicker, lasts longer, saves you parts repairs and downtime—Malleabrasive means *cheaper cleaning.*

Words won't prove it—the final test is in *your* equipment. Try Malleabrasive on your jobs and see for yourself. Next time you order blast cleaning abrasive, specify Malleabrasive from PANGBORN CORP., 1400 Pangborn Blvd., Hagerstown, Md.

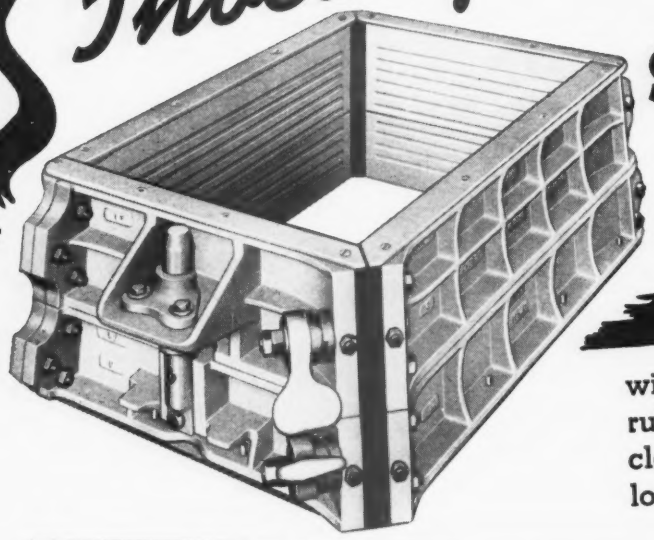
Pangborn DISTRIBUTORS FOR

MALLEABRASIVE®

PANGBORN'S 50th ANNIVERSARY—1904-1954

*U. S. Patent #2184926
(other patents pending)

Investigate the new FREMONT SPREADLOCK FLASK



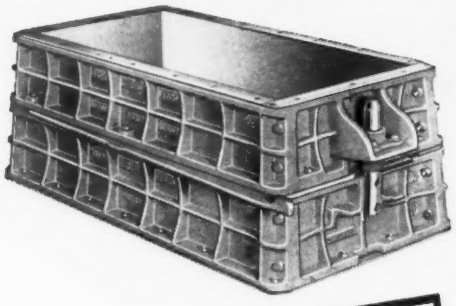
with the long-life, easily replaceable, live-rubber corner inserts which completely close the corner gaps so that no sand can lodge in the open corners.

PERFECT ALIGNMENT Indefinitely!

is guaranteed by the one-inch GROOV-LOCK FOOLPROOF PIN on

FREMONT STANDARD SLIP FLASKS

They are particularly adapted to cope or drag pattern jobs. Other types of standard pin fittings are also available. Solid, bolted and welded corner construction is a feature of Fremont Standard Slip Flasks.



Fremont Magnesium Flasks point the way to more exacting work. Accurately machined inside surfaces and flanges. Steel-faced top and bottom flanges. Magnesium has twice the tensile strength of aluminum, thus assuring longer service, and magnesium weighs 1/3 less than aluminum, making for easier handling.

Write today for free literature and prices.
All orders given prompt attention.

THE FREMONT FLASK COMPANY

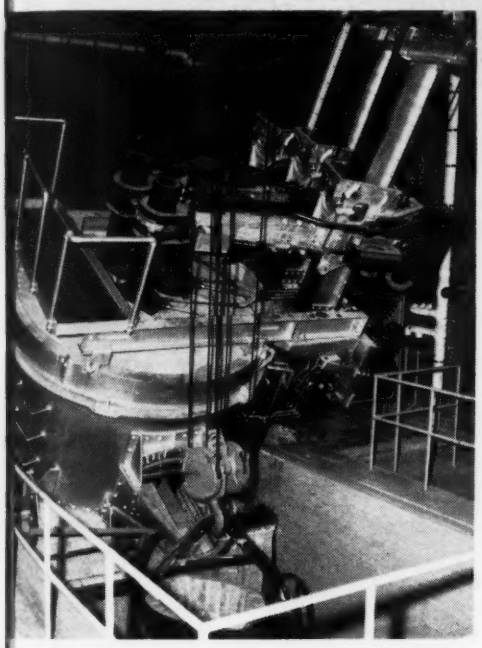
FREMONT, OHIO

• ONE OF A SERIES OF MESSAGES TO MODERN FOUNDRY MANAGEMENT

SWINDELL

SINCE 1850

FOUNDRY ELECTRIC MELTING FURNACES ENGINEERED AND BUILT TO HIGHEST STEEL MILL STANDARDS



Swindell Electric Melting Furnaces for foundry service provide the productivity, low maintenance and long useful life built-in by genuine steel mill design and construction by steel mill melting furnace specialists. Write for a consultation.

WRITE for your copy of the latest Swindell Electric Melting Furnace Catalog — sent promptly on request.

Typical Quality Features

- **RUGGED, OVERSIZED ROOF CYLINDER** in permanent engagement with roof superstructure insures proper sequence. No manual clamps or kingposts—no special foundation. Cylinder is powered to level pyramided charged scrap in seconds.
- **SIMPLE, LOW COST FOUNDATIONS.** No cable tunnels or elaborate cable reeving—electrode hoist and roof cylinders are integral with furnace for proven maximum "on the line" performance.
- **INSTANTANEOUS ELECTRICAL RESPONSE.** Split-second control of melting is provided by Swindell service-certified electrical system.
- **REMOTE CONTROLLED ELECTRODE HOLDERS.** All vital parts out of heat and danger zone—yet accessible for quick visual inspection or maintenance.
- **4-POINT ROOF SUSPENSION.** Eliminates warpage; roof floats. Roof-change in minutes. An original SWINDELL development.
- **OVERSIZED I-BEAM ROOF RINGS** of Swindell design. Generous inside diameter to prevent damage to ring and refractory skewback. Built from true structural I-beam—no welds inside to fail from thermal shock. All welds outside to prevent cooling water reaching hearth area in event of damage.
- **BALANCED MELT-DOWN ECONOMY.** Optimum melt-down speed is integrated with correct KVA rating and furnace diameter for each furnace size, providing maximum performance without penalty in refractory and maintenance costs.

SWINDELL-DRESSLER
CORPORATION
Designers and Builders of Modern Industrial Furnaces
PITTSBURGH 30, PA.

● Fluidity spiral of gray iron deoxidized with FERROCARBO® is 40% longer than spiral yielded by untreated gray iron.

BETTER CASTINGS start with more fluid iron...

And iron deoxidized with FERROCARBO® patented Briquettes *is more fluid* at casting temperatures than untreated iron. You can prove this in a ten day test in your cupola. Longer runs are evident from the first day you add FERROCARBO to the charge. After eight to ten days, when the sprues and returns are saturated, the spiral fluidity molds will show ***considerably longer*** runs.

Another advantage is a substantial reduction in misruns—especially in castings with complicated molds and thin sections. You will get increased silicon recovery, too; and you can charge more scrap—steel or cast iron—because FERROCARBO reduces the chilling tendency.

The man who uses your castings will find them finer-grained, denser, stronger... much easier to machine (and easier on his tools) because they contain fewer segregations, chilled or hard spots.

● **MAKE YOUR OWN TEST.** Call your FERROCARBO Distributor today. Or write for the free booklet, "Producing Superior Gray Iron Castings." Address: The Carborundum Company, Dept. F 84-43, Niagara Falls, N. Y.

FERROCARBO DISTRIBUTORS:

KERCHNER, MARSHALL & CO.
PITTSBURGH • Cleveland • Buffalo
Philadelphia • Birmingham • Los Angeles

MILLER & COMPANY
CHICAGO • St. Louis • Cincinnati

WILLIAMS & WILSON
TORONTO • Montreal • Windsor

● *In Canada, "Carborundum" and "Ferrocarbo" are registered trademarks of Canadian Carborundum Company, Ltd., Niagara Falls, Ontario*

FERROCARBO by CARBORUNDUM

REGISTERED TRADE MARK

REGISTERED TRADE MARK

84-43

DELTA *fast-dri*

LIQUID RESINS AND BINDERS FOR *FASTER PRODUCTION* OF BETTER CORES *at lower cost!*

Cores made with DELTA 155-X and 168-X FAST-DRI Liquid Resins have 1) — an unusually high tensile strength (20% greater than linseed oil), 2) — a lower gas ratio, 3) — a higher degree of elasticity, 4) — less core embrittlement and 5) — greater surface core hardness.

Core sand mixes made with DELTA FAST-DRI Liquid Resins have excellent flowability resulting in denser cores and better workability in core boxes.

The uniformity of DELTA 155-X and 168-X FAST-DRI Liquid Resins is guaranteed. The chemical and physical constants are maintained by strict laboratory control.

OTHER DELTA FOUNDRY PRODUCTS

CORE AND MOLD WASHES:
For all types of sand cast metals: Steel, Gray Iron, Malleable and Non-Ferrous.

•

PARTING COMPOUNDS

•

MUDDING AND PATCHING COMPOUNDS

•

NO-VEIN COMPOUND

•

MOLD SURFACE BINDERS – LIQUID

•

PERMI-BOND

•

DRI-BOND
(Dry Binder)

•

BONDITE BINDER

•

96•B SAND RELEASE AGENT

•

CORE ROD DIP OIL NO. 224X

•

SAND CONDITIONING OIL

•

CORE OILS

•

DELTA-DIETERT PROCESS BINDER 103XX
For "D" process shell cores.

•

DELTA

Working samples for test purposes together with complete data are available to you. Included, also, will be information on other Delta Core Oils, Delta Dri-Bond and Delta Bondite. Your request will receive immediate attention.

DELTA OIL PRODUCTS CO.

MANUFACTURERS OF SCIENTIFICALLY CONTROLLED FOUNDRY PRODUCTS

MILWAUKEE 9, WISCONSIN

Conversion to Castings

THE NEW, BIGGER MARKET FOR FOUNDRIES!

By simplifying and redesigning existing parts so that they can be cast, aggressive foundries are converting more and more new users to low cost castings. By showing cost cutting advantages to their prospects they are building a whole *new* business for themselves.

Here's a typical example from one foundry:

This part was originally designed as a fabricated assembly, with numerous sub-parts. The foundry redesigned and engineered it as a one-piece steel casting. The result is a stronger part, with more eye appeal and better distribution of metal. *Yet it costs 28.2% less*, delivered as a complete unit, machined and painted.

BEFORE REDESIGNING

AFTER REDESIGNING

In such conversions we can be of real help. Here are just two of the ways Magnaflux can help you get more business by conversion.

First . . . Stress analysis with Magnaflux' Stresscoat* helps you to quickly design castings of exactly the right characteristics for a particular job. By showing stress in parts quickly and positively, Stresscoat insures castings with even stress flow. These are easier to pour, lighter, stronger and better looking.

Second . . . Intelligent sampling inspection with Magnaflux* helps you turn out better castings at lower cost. Magnaflux finds *all cracks* in pilot runs. It helps you determine *why* and *where* cracks occur—whether they are serious—and how to correct the cause before parts are run in quantity and later rejected.

** Magnaflux and Stresscoat are registered trademarks of Magnaflux Corporation*

Ask to have a Magnaflux engineer give you further facts and figures.

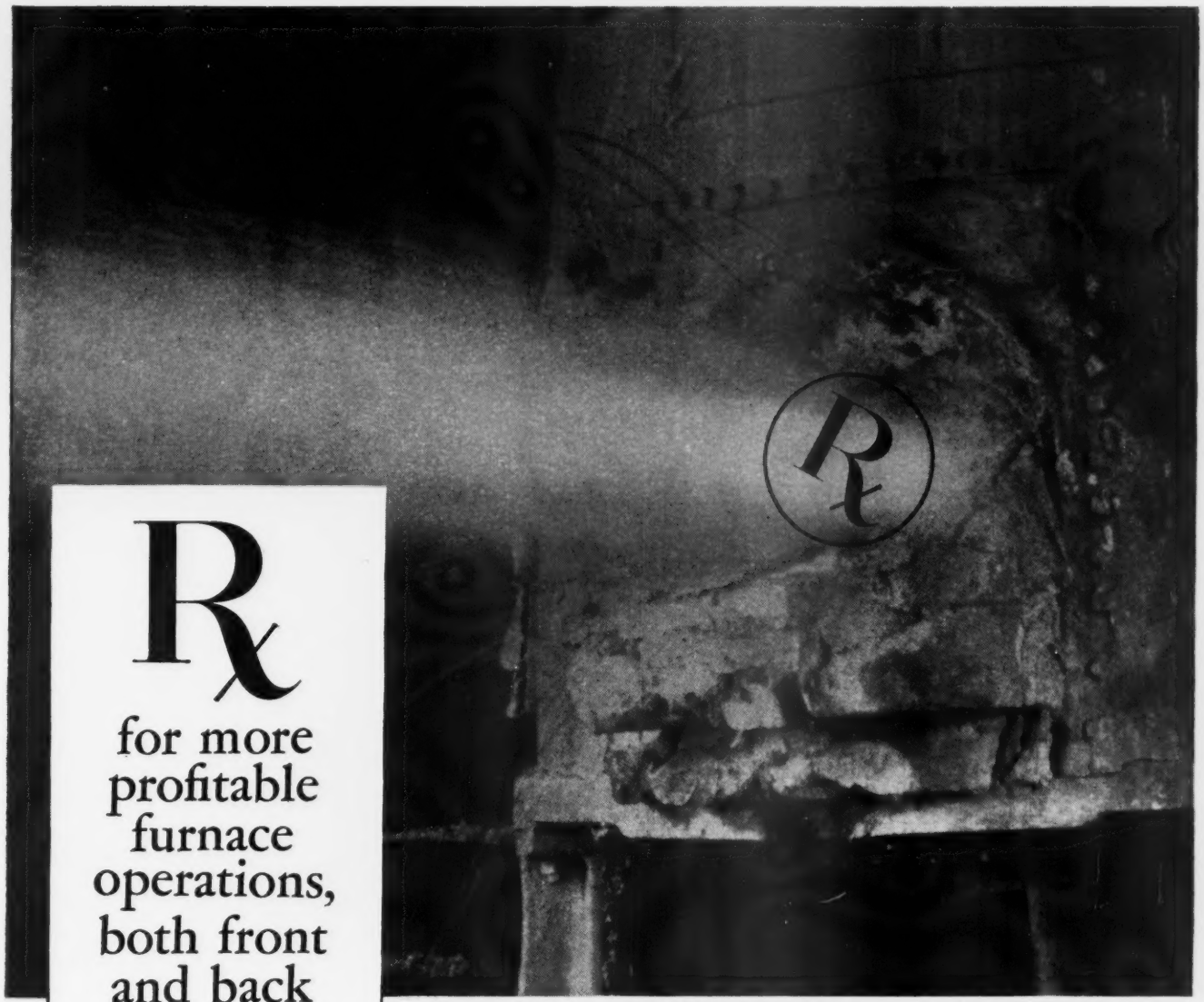
Photos and Data Courtesy of Superior Steel and Malleable Castings Co. Benton Harbor, Michigan

MAGNAFLUX CORPORATION

7350 West Lawrence Avenue, Chicago 31, Illinois

New York 36 • Pittsburgh 36 • Cleveland 15 • Detroit 11

Dallas 19 • Los Angeles 58



Rx for more profitable furnace operations, both front and back slagging . . .

You can maintain hot metal schedules for your casting line and avoid costly shutdowns by using Norton *engineered and prescribed* CRYSTOLON refractories — slag hole blocks for back slagging cupolas, bricks and cement for front slagging cupolas.

Norton CRYSTOLON* refractories

If too much cupola down-time is slowing your metal-melting operation and cutting your profits, here's a Norton Rx to solve your problem:

Standardize on CRYSTOLON refractories — *engineered* for highest efficiency in the handling of neutral and acid cupola slags.

For back slagging cupola the Rx is CRYSTOLON slag hole blocks. For capping the notch and lining the slag chute in front slagging cupolas it's CRYSTOLON bricks and cement.

Wherever you use it, this top-quality refractory material will stand up under temperatures up to 3050°F without softening, spalling or cracking. Its extreme density assures exceptional resistance to slag penetration and chemical attacks — and it has 5 to 15 times the resistance of ordinary fire clay to erosion and corrosion.

In your own production, these advantages mean more continuous, more trouble-free furnace operations, at lower cost. CRYSTOLON bricks and blocks are made in sizes and shapes to meet every foundry requirement. For complete facts, see your Norton Representative. Or write to NORTON COMPANY, 307 New Bond St., Worcester 6, Mass. *Canadian Representative:* A. P. Green Fire Brick Co., Ltd., Toronto 5, Ontario.

NORTON
REFRACTORIES
Engineered . . . Rx . . . Prescribed
Making better products . . . to make other products better

*Trade-Mark Reg. U.S. Pat. Off. and Foreign Countries

Completely New and
Proven Operating Principle

Custom Built in
any Length, Width or Depth

ADAMS CHERRY EASY-OFF FLASK

These advantages will cut your production costs!

SIDES AND ENDS finished 1⅛" on all standard size flasks. 1¼" and heavier on flasks of larger perimeters and depths. Cherry lumber is finest available; air dried.

SOLID CORNERS are machine locked to maintain alignment and to insure maximum rigidity.

MALLEABLE TRIMMINGS are another famous Adams feature; assure long life and exceptional service.

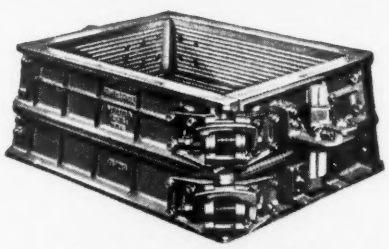
OPERATING MECHANISMS are completely new in design, yet of proven construction. Exceptionally simple, offering single-point adjustment; ease of operation on tough jobs.

ADJUSTMENTS made *only* when mechanism is in *locked* position.

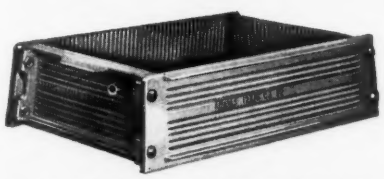
SPECIALLY DESIGNED INSERTS located in main body castings permit reversal of locking position. As "standard" flasks are furnished with handles locking in "up" position. To change, remove main bolt handles and inserts, reverse inserts and handles and reassemble.

ALUMINUM PROTECTING STRIPS are standard equipment at top of cope, bottom of drag and at parting. Steel strips available upon request at no extra charge.

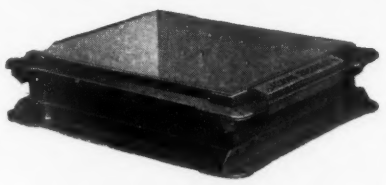
WIDE "V" PINS & EARS standard on all flasks. All other types of pin and ear arrangements are available to interchange with your present pattern plate guides.



Adams Aluminum Easy-Off Flask



Adams Jackets, Cast Iron or Aluminum



Adams Steel Jackets

Write today for full details . . .

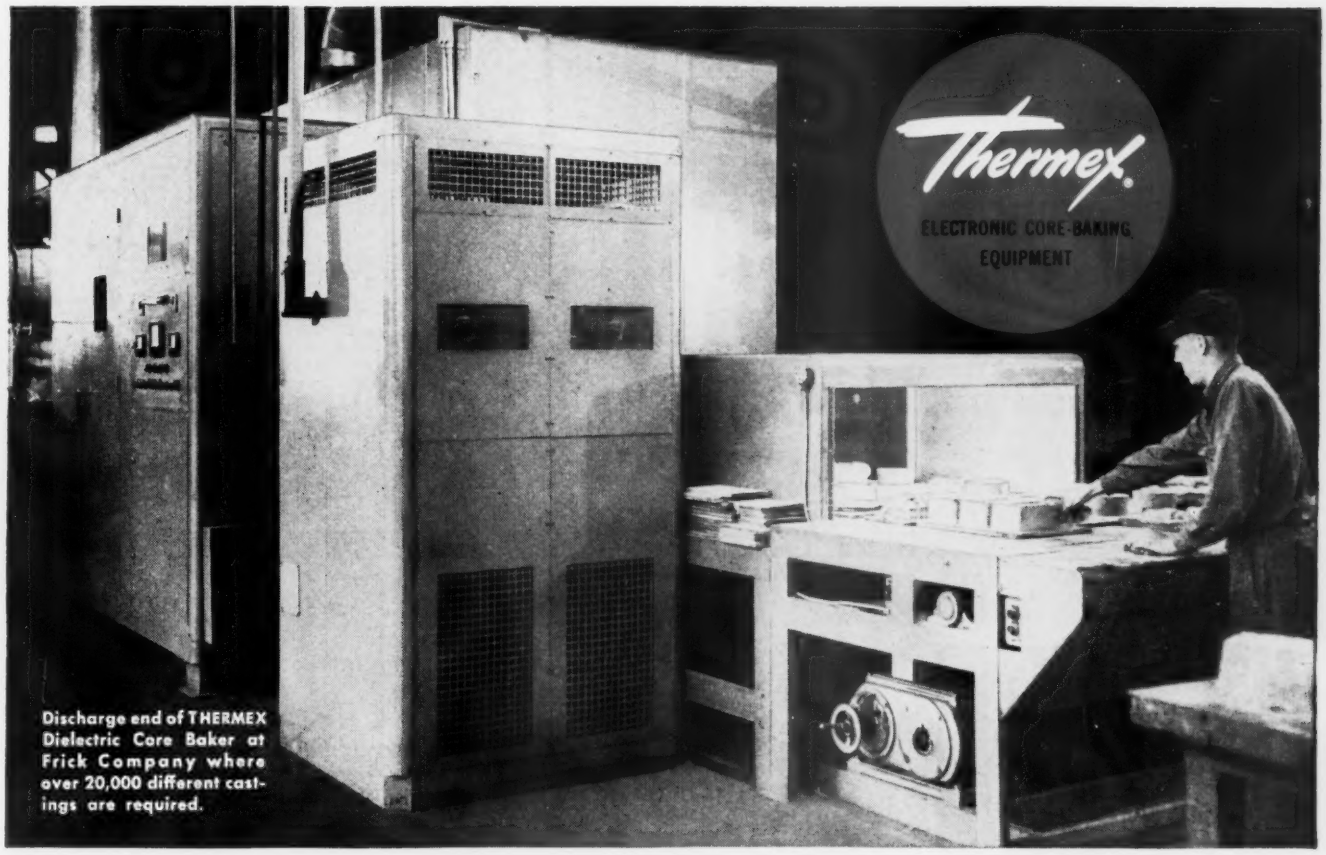
Cherry Snap Flasks—Cherry Slip Flasks—Aluminum Slip Flasks—Easy-Off Flasks
Cherry Presser Boards—Wood Bottom Boards—Steel Bottom Plates—Steel Jackets
Aluminum or Cast Iron Jackets—Steel Bands—Steel Upsets—Cherry or Aluminum Upsets

The ADAMS Company

ESTABLISHED 1883

MOLDING MACHINES and FLASK EQUIPMENT

700 FOSTER STREET, DUBUQUE, IOWA, U.S.A.



Discharge end of THERMEX Dielectric Core Baker at Frick Company where over 20,000 different castings are required.

How Frick Company has improved core quality and working conditions

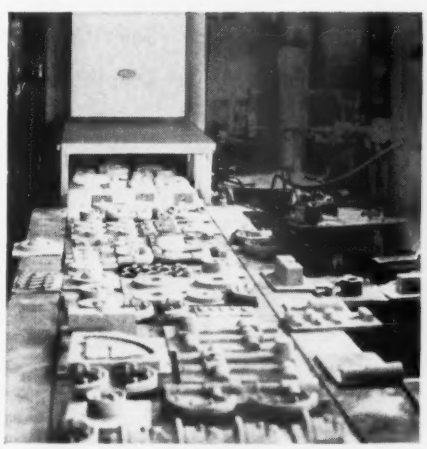
REPLACING conventional ovens with a 75 KW THERMEX* Core Baker at Frick Company, Waynesboro, Pa. has resulted in improved core quality . . . faster, more flexible production . . . a cleaner core room and saving of floor space.

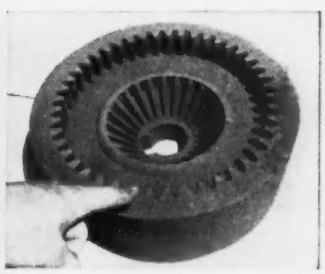
IMPROVED QUALITY. Uniform electronic baking gives smoother core surfaces and greater dimensional accuracy. No longer necessary to paint cores to prevent iron penetration.

IMPROVED WORKING CONDITIONS. No smoke. No oven heat. Cores are cool enough to handle immediately after baking . . . move faster to finishing and pasting.

Find out how THERMEX Core Baking Equipment can improve your core room efficiency. Write today for data booklet on Electronic Core Baking. The Girdler Company, Thermex Division, Louisville 1, Kentucky.

*THERMEX—Trade-mark Reg. U. S. Pat. Off.





Intake end of THERMEX Core Baker showing variety of cores on belt, which moves at about 7 inches per minute. Typical Frick cores where accuracy is important: (Right above) For portable sawmill gear. (Right below) For ammonia valve body.

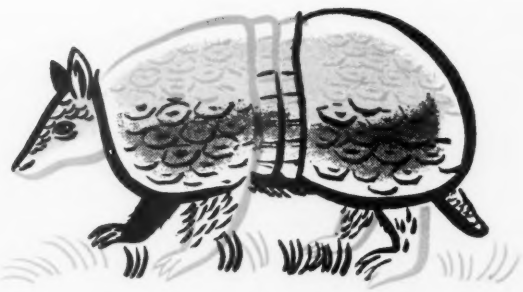
the GIRDLER Company

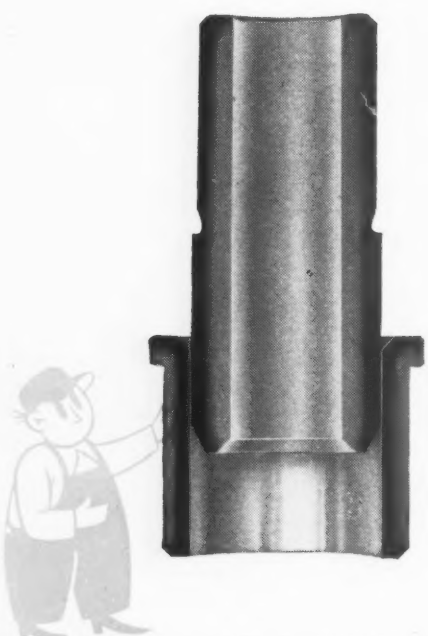
A DIVISION OF NATIONAL CYLINDER GAS COMPANY

THERMEX DIVISION

designed like an ARMADILLO

hardened wearing surfaces and ductile cores increase life of UNIVERSAL flask pins and bushings





Universal flask pins and bushings are double quenched and double drawn to produce strong, ductile cores with a fine grain structure to enable them to withstand considerable stress, strain and rough treatment in the foundry without breaking or chipping. The wearing surfaces of both pins and bushings are carburized and hardened to improve their wearing qualities and prolong their life. Universal flask pins and bushings are precision ground to extremely close tolerances to help assure instant, accurate alignment of cope and drag. Plain or taper, round or hexagonal and threaded or plain types are available in a complete range of sizes. For complete information, write to the office nearest you — Universal Engineering Sales Co., 1060 Broad St., Newark 2, N. J.; 5035 Sixth Avenue, Kenosha, Wis. — or the home office.

175

UNIVERSAL ENGINEERING COMPANY FRANKENMUTH 4, MICHIGAN

Powder-Cutting Saves $2,000

This 3-ton, 13-in. thick manganese-bronze flywheel casting was reduced to furnace-charging size by powder-cutting in less than 8 hours. Previous methods required over 16 hr. to cut up a casting only 4-in. thick. Powder-cutting proved to be the most economical method for this job.

Powder-cutting replaced cold-sawing in this foundry operation, and did three times the cutting in half the time.

LINDE engineers were called in to help solve the problem of reducing giant flywheel castings to furnace-charging size. The castings had been part of an experimental program to develop accurately balanced flywheels for diesel engines. Test castings had to be cut for remelting. . . . But because of their great size, scrapping by formerly used methods would have been costly—if possible at all. LINDE advised powder-cutting.

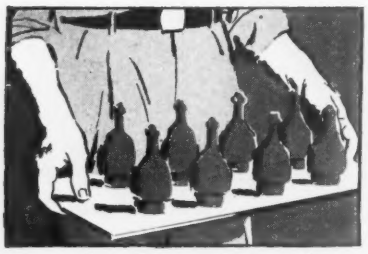
In powder-cutting, a powdered metal is added to the oxygen stream to raise the temperature of the cutting flame, and increase the speed of the severing action. Among other things foundries are using powder-cutting to remove gates and risers from stainless steel castings, to wash away sand-incrusted casting surfaces, and for gouging out defects prior to repair welding.

LINDE service engineers will be glad to help you determine the best powder-cutting setups or other uses of the oxy-acetylene process for your needs.

LINDE AIR PRODUCTS COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY
Division of Union Carbide Canada Limited

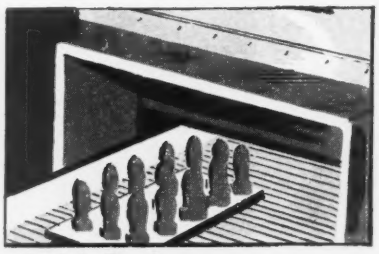
Linde Trade-Mark

"Linde" is a registered trade-mark of Union Carbide and Carbon Corporation.



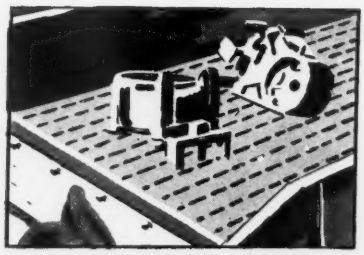
Superior Green Strength

Mogul imparts sag resistance and dimensional stability throughout handling and storage.



Quick Drying

All of our cereal binders and dextrines have this property, enabling you to increase oven capacity.



Adequate Collapsibility

These binders burn out at the desired moment, producing uniformly smooth draws.

A cereal binder for every bonding need

A complete line of foundry binders from the world's prime producer of corn products

THESE CEREAL BINDERS ARE PREFERRED FOR THEIR

- **CONSTANT AVAILABILITY**
- **SUPERIOR UNIFORMITY**
- **BROAD ADAPTABILITY**

Why you get greater green strength with MOGUL® Cereal Binder

Specially developed to meet today's needs for greater efficiency, Mogul Corn Cereal Binder is unique in the industry. Carefully controlled modern wet-milling processes produce a uniform product. Because of its bonding power in the wet state, Mogul Binder produces a core of great sag resistance and dimensional stability. Cores made with Mogul Binder produce castings with finer finish and exceedingly true pattern reproduction.

Why you get greater dry bond with KORDEK®

Kordek Core Binder renders complete binder coverage for foundry purposes. Kordek Core Binder develops a superior dry bond. Kordek is highly soluble, does not absorb core oil, and burns out completely, producing smooth draws. Kordek, a uniform product, is readily available in quantities to suit your needs.

Ask our technical service people how these superior cereal binders can help solve your casting problems. A special new foundry laboratory is ready to serve you. There is no charge or obligation for this service.

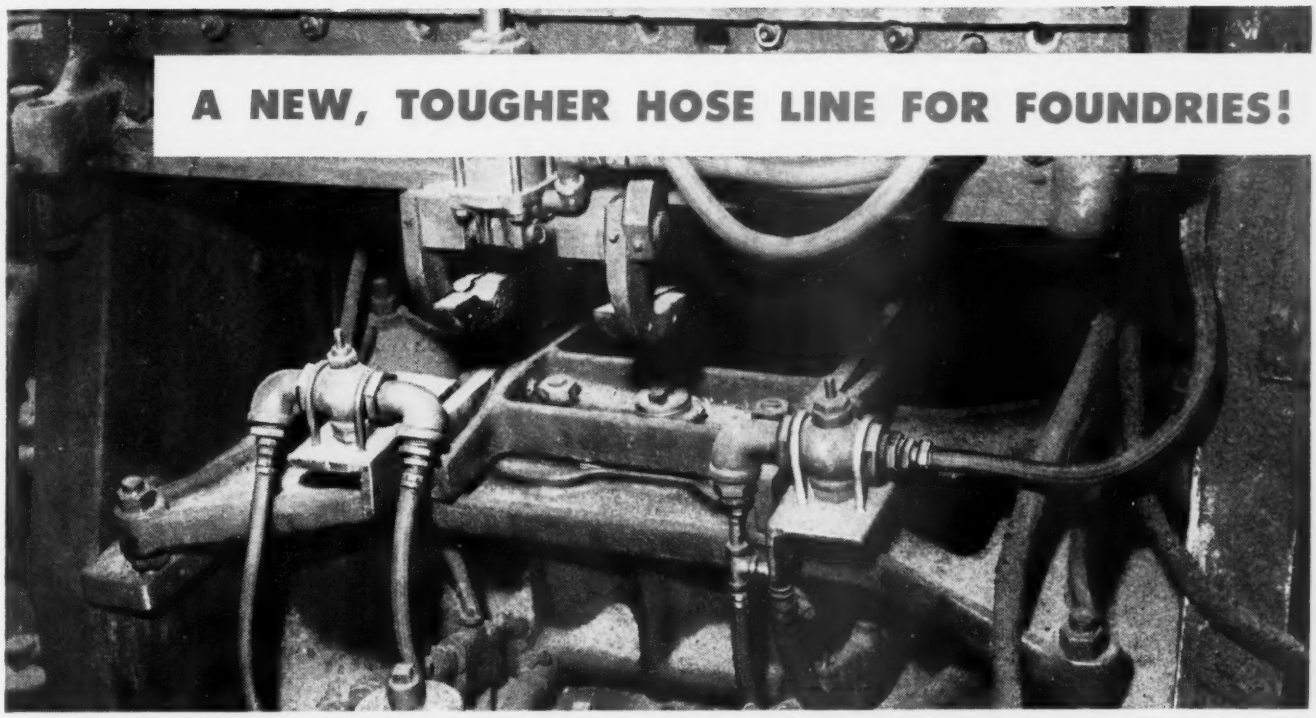
Why GLOBE® Dextrines regulate core hardness

The variety of solubilities available in Globe Dextrines enables you to achieve the degree of surface hardness you require. The controlled migrating properties of Globe Dextrines assures you of a smooth, hard surface when you want it and complete burn-out at the proper moment. Globe Brand Dextrines enable you to achieve exactly the collapse rate you desire, thus assuring you clean castings with close tolerances and a minimum of scrap.

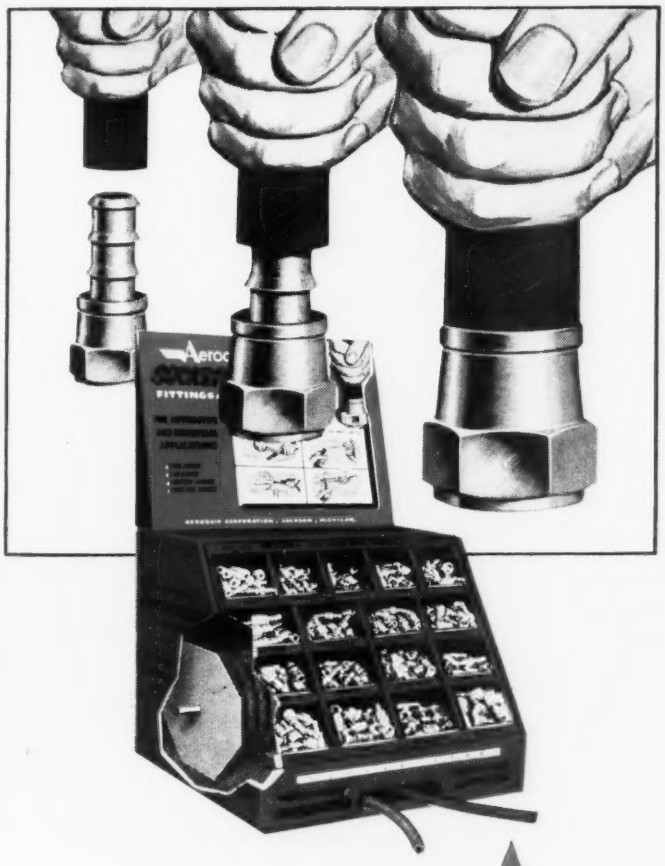
GLOBE

CORN PRODUCTS REFINING COMPANY • 17 BATTERY PLACE, NEW YORK 4, N. Y.

A NEW, TOUGHER HOSE LINE FOR FOUNDRIES!



Typical foundry application—a core roll-over draw machine.



NEW! AEROQUIP *SOCKETLESS* FITTINGS AND HOSE

- ✓ *Assemble in seconds*
- ✓ *Low in cost*
- ✓ *Pressures up to 250 PSI*
- ✓ *Complete, compact Inventory Kit*

This new, tougher hose line gives longer life! Squashing pressure, exposure to heat, grit and oil cause quick damage to ordinary air hose. You'll find Aeroquip *SOCKETLESS* hose lines far tougher . . . much more durable . . . made to withstand rough foundry treatment.

Make fast hose line replacements that won't blow off! Just cut 1525 hose to the proper length, *push* the hose on the *SOCKETLESS* fittings, and your hose line is ready in seconds. The fittings will not blow off even at 250 PSI.

This new SOCKETLESS kit simplifies your inventory. Included are a wide assortment of fittings and reels of ¼" and ⅜" bulk hose ready for instant use. Use *SOCKETLESS* hose lines for fuel, water and oil, as well as air lines. See your distributor or write us for more information.

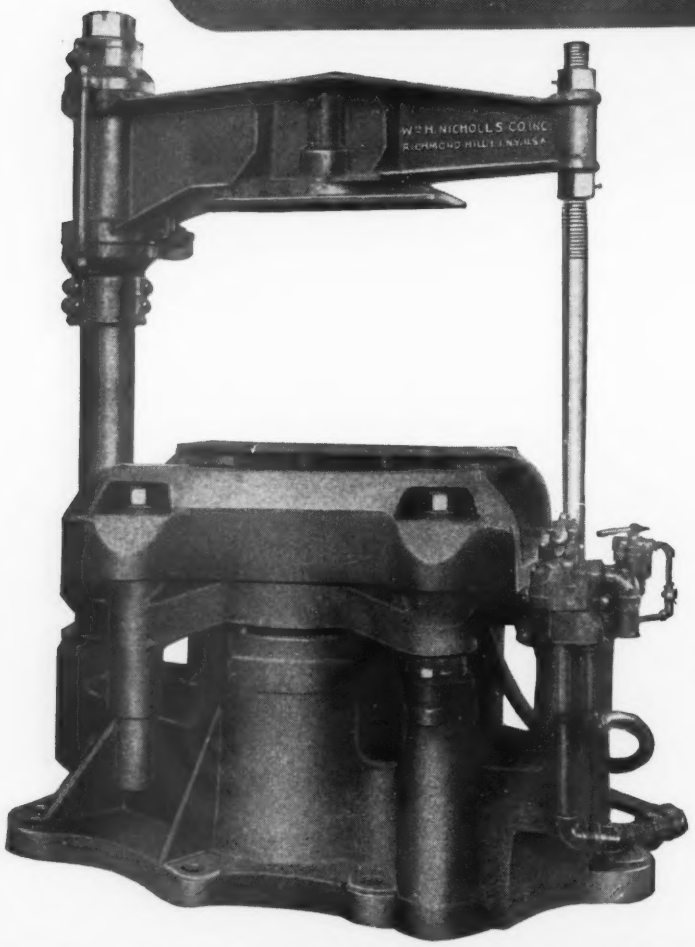
Aeroquip

REG. TRADE MARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN

LOCAL REPRESENTATIVES IN PRINCIPAL CITIES IN U.S.A. AND ABROAD • AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

MINIMUM WORKING PARTS...



MAXIMUM MOLDING EFFICIENCY

Nicholls' long experience has made possible the design of heavy duty molding machines with the minimum of working parts.

Result: lower maintenance and labor costs, increased efficiency and production, simplicity that enables unskilled labor to learn how to make molds in record time.

A glance at these Nicholls features will show you why Nicholls Molding Machines are preferred by leading foundries everywhere:

● ***Crossarm equipped with a parallel squeeze plate to reduce the amount of crossarm travel*** ● ***Quick action*** ● ***Open end frame to allow for flexibility in pattern lengths*** ● ***16"-18"-20"-33" diameter squeeze pistons*** ● ***7"-8"-9"-13" diameter jolt pistons*** ● ***Can be supplied with push button control***

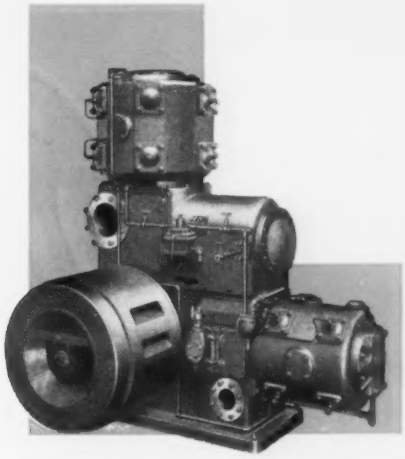
If you're after consistently better castings, you'll look to Nicholls every time.

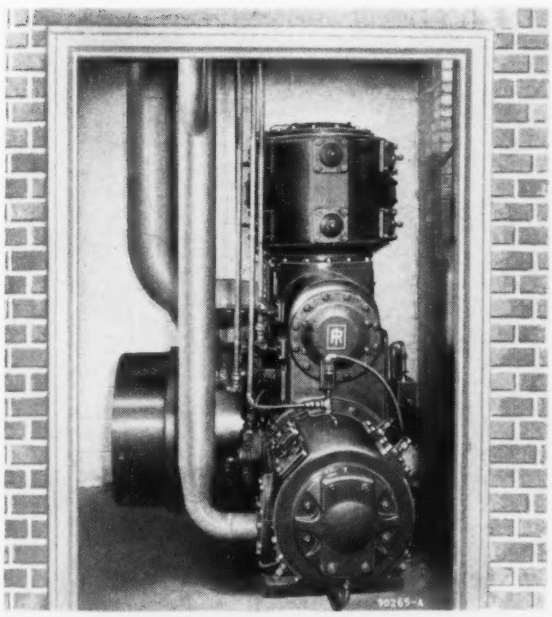
Wm. H. Nicholls Co., Inc., Richmond Hill 18, Long Island, N. Y.

NICHOLLS

MORE AIR POWER in less floor space

That's one of the many advantages offered by this space-saving **XLE** *compressor:*





A bronze company squeezed this XLE into a small, unused storage room.

Packaged design for minimum floor space, and specially balanced for minimum foundation... ideal for skid-mounting.

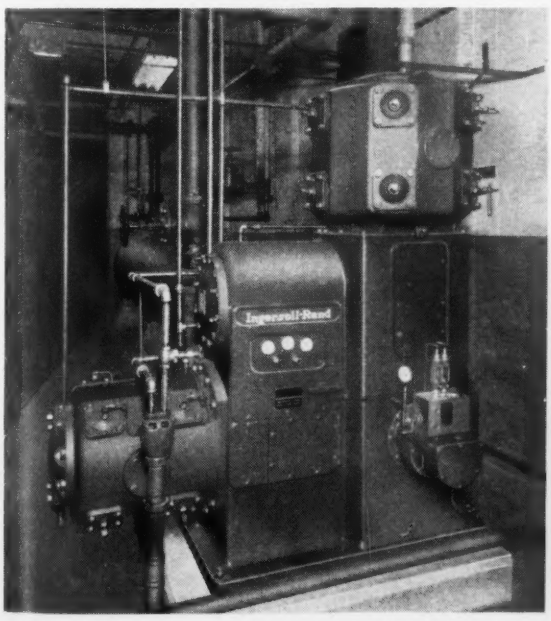
Easy to operate... push button starting, grouped controls, automatic force-feed lubrication, automatic condensate removal, automatic air-operated starting unloaders and capacity control.

Easy to install or relocate... ready-to-run, assembled shipment ... simplified air and water piping.

Easy to maintain... simplified long-life construction... full-floating, cool-running, aluminum-alloy bearings that require no adjustment... no need to open the sealed crankcase which stays clean inside... streamlined exterior also easy to keep clean.

Low operating costs... new high-efficiency, long-life I-R Type A Channel Valves result in compressor efficiency comparable to the largest units... durable, high-efficiency tube-and-fin intercooler saves water... efficient direct-connected motor.

Built for reliable, continuous full-load service... sizes 125, 150, 200, 250, 300, 350 horsepower... discharge pressures 80 to 125-psi, two stage... write for more information today.

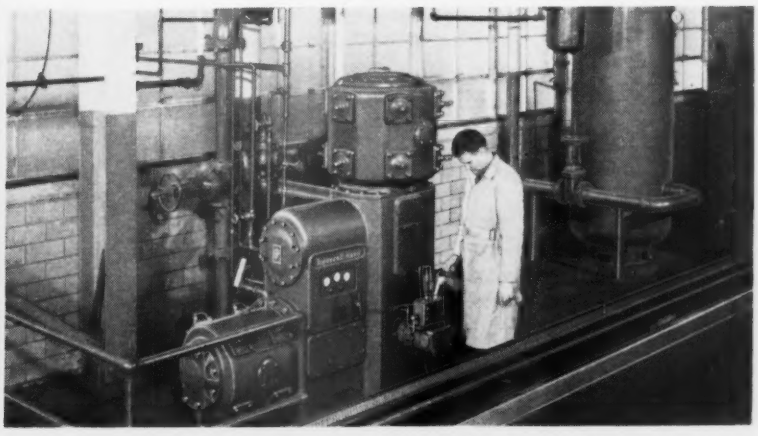


A safety-razor manufacturer found plenty of space for this XLE installation in a screened-off basement corner.

Ingersoll-Rand

I-105 11 Broadway, New York 4, N. Y.

COMPRESSORS • AIR TOOLS • ROCK DRILLS
TURBO BLOWERS • CONDENSERS • CENTRIFUGAL PUMPS
DIESEL AND GAS ENGINES



And here's a compact, space-saving installation of an XLE compressor, aftercooler and air receiver in a tool plant

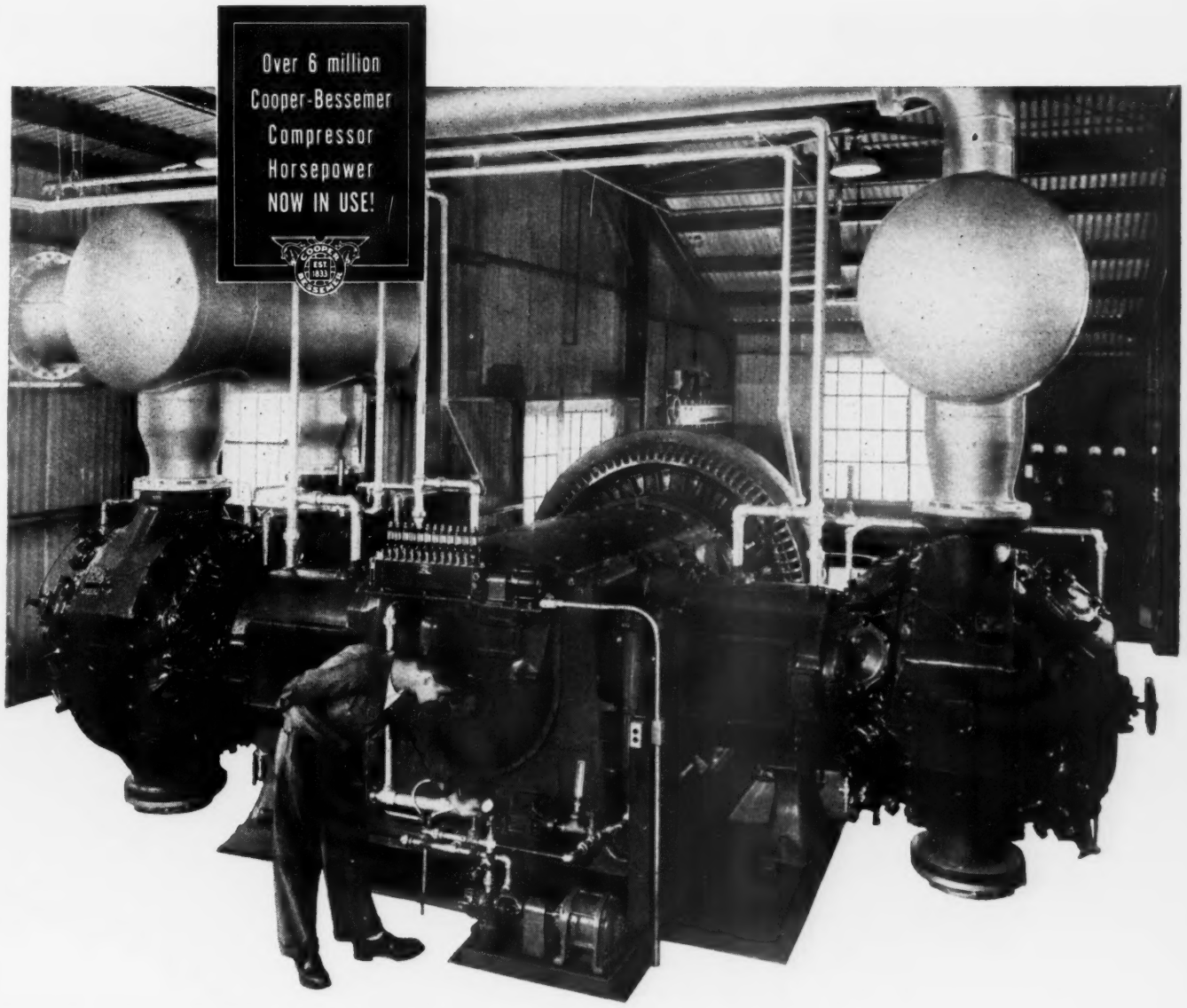
Over 60 Years of Dependable Service to the Foundry Industry

We're looking forward—not backward. Today, in a new plant, with modern manufacturing facilities, The Shanafelt Co. is building the finest steel flask in its many, many years of building this dependable product. And there are new improvements ahead.

It is a great satisfaction to realize that we're here today because foundrymen have found our products good, our prices sensible, and our promises dependable. Let us assure all our friends that, while we'll always change and improve our products, we'll never change the fundamental policies that have given us these 60 successful business years.

THE SHANAFELT MANUFACTURING CO.

2600 - 2700 Winfield Way N. E., Canton, Ohio



FOR PFIZER ANTIBIOTICS . . . *the "healthiest" of compressors*

AT Chas. Pfizer & Co., Inc., Vigo plant in Terre Haute, antibiotic processing is a *continuous* operation, requiring lots of air. And since air failure would be disastrous, it was essential to have the most reliable compressor obtainable. The Cooper-Bessemer unit shown above was installed over a year ago; has been in virtually constant 24-hour-a-day operation ever since.

There's all kinds of proof that you can't top a Cooper-Bessemer compressor for reliability. What's more, its modern, compact design, with vibration-free opposed action, means smoothest operation, simplified maintenance, and substantial savings in space and foundation requirements.

Send for the latest bulletin, shown here, or check with the nearest Cooper-Bessemer office on the money-saving unit just right for your needs.

SEND FOR YOUR COPY

Covers Cooper-Bessemer Type M compressors, 200 to 1000 hp. Other bulletins covering still larger size units are also yours for the asking.

The Cooper-Bessemer Corporation

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York Washington, D. C. Bradford, Pa. San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Tulsa Shreveport St. Louis Los Angeles Chicago Caracas, Venezuela Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Gloucester, Mass. New Orleans, La.

MODERN WAY to dry molds

Here's the quick, easy, *modern* way to dry molds—with an oil-fired Silent Glow Portable Heater. Safe . . . instant . . . completely *portable* heat brought right to the mold. Time-saving . . . space-saving . . . money-saving advantages over conventional coal-fired ovens.

INSTANT PORTABLE HEAT
. . . at the flick of a switch
. . . where you want it . . . when you want it.

MODEL ID *up to 420,000 BTU per hr.*

8 MODELS—*from 168,000 to 420,000 BTU per hour . . . for a hundred-and-one heating jobs around the foundry. Send for details.*

SILENT GLOW *Portable* **HEAT**
BUILT TO DELIVER
BUILT TO TAKE IT

THE SILENT GLOW OIL BURNER CORP.
850 WINDSOR STREET, HARTFORD 1, CONNECTICUT

READERS' COMMENT

Foundry Trade Names

TO THE EDITORS:

Many thanks for sending your "Trade Names" booklet. As ever your service is first class and a great boon to us in the field.

OWEN DIBBS
Works Manager

Taylor-Forbes (1953) Ltd.
Guelph, Ont., Canada

Editor's note: Single copies of this directory of foundry trade names, reprinted from our March 1954, issue, are available on request.

* * *

No More Snow Shovel

TO THE EDITORS:

My wife and I would like to thank FOUNDRY for the opportunity to tell all our old friends that we have fulfilled our ambition and desire to throw away the snow shovel for keeps. I recently resigned as superintendent of Gartland Haswell Foundry Co., Sidney, Ohio, to retire from active foundry supervision after 48 years plus, from sand rat to superintendent. My apprenticeship was served under Fred Hunt, Morrison Foundry Co., Newark, N. J., during which time I also attended Newark Tech, now College of Engineering, and graduated with the class of 1911.

After completing both, I traveled the eastern states for three years, returned to Morrison as foreman for eight years, resigned to join American Radiator Co., Bayonne, N. J., as foundry superintendent, spent three years as plant superintendent and eight years as assistant manager, leaving in 1933 to join Fowler & Wolfe, Norristown, Pa., for three years. After a short period selling and installing General Electric heating systems, I joined George S. May Industrial Engineers, Atlanta Division, as foundry engineer in southern and southwestern states. After traveling all 14 states from East to West several times, I joined Burnham Boiler Corp., Zanesville, O., and left after five years to join Mr. M. B. McKee at Sidney, O.

After I had worked with Mack for 11 years, it was hard to leave. However, having spent close to half a century in the foundry, I decided to spend the rest the good Lord has allotted to me down in the Sunshine state of Florida. And we love it. We have not had much time to fish and play golf. There are lots of jobs to be done around a new home if you want it to look nice. But my wife and I enjoy our dips in the Gulf. When the jobs are all done, who knows, I may be willing to trade my knowledge and experience for limited intervals.

JOHN (JACK) HORROCKS
520 *Brookside Drive*
Clearwater, Fla.

* * *

Minimum Specifications

YOUR EDITORIAL EMPHASIZING QUALITY IN OCTOBER ISSUE OF FOUNDRY IS SPLENDID. COULD YOU SUPPLY US WITH 200 COPIES?

IVAN L. JOHNSON
Pacific Steel Casting Co.
Berkeley, Calif.

●

TO THE EDITORS:

I want to tell you that your editorial "Emphasizing Quality" page 103 of the October issue of FOUNDRY magazine, is concise and to the point.

You are to be congratulated on your promptness in calling this action on the part of the Steel Founders' Society of America to the attention of all foundrymen. I have been a strong advocator of this for many years and believe that this is a step in the right direction and should be accepted by all foundries.

C. L. HARRELL
President
Sterling Steel Casting Co.
East St. Louis, Ill.

* * *

A Contrast in Foundries

TO THE EDITORS:

Mare Island Navy Yard, Vallejo, Calif., conducted its centennial celebration Sept. 16-19, and I thought that FOUNDRY readers might like to hear a little about the installation.

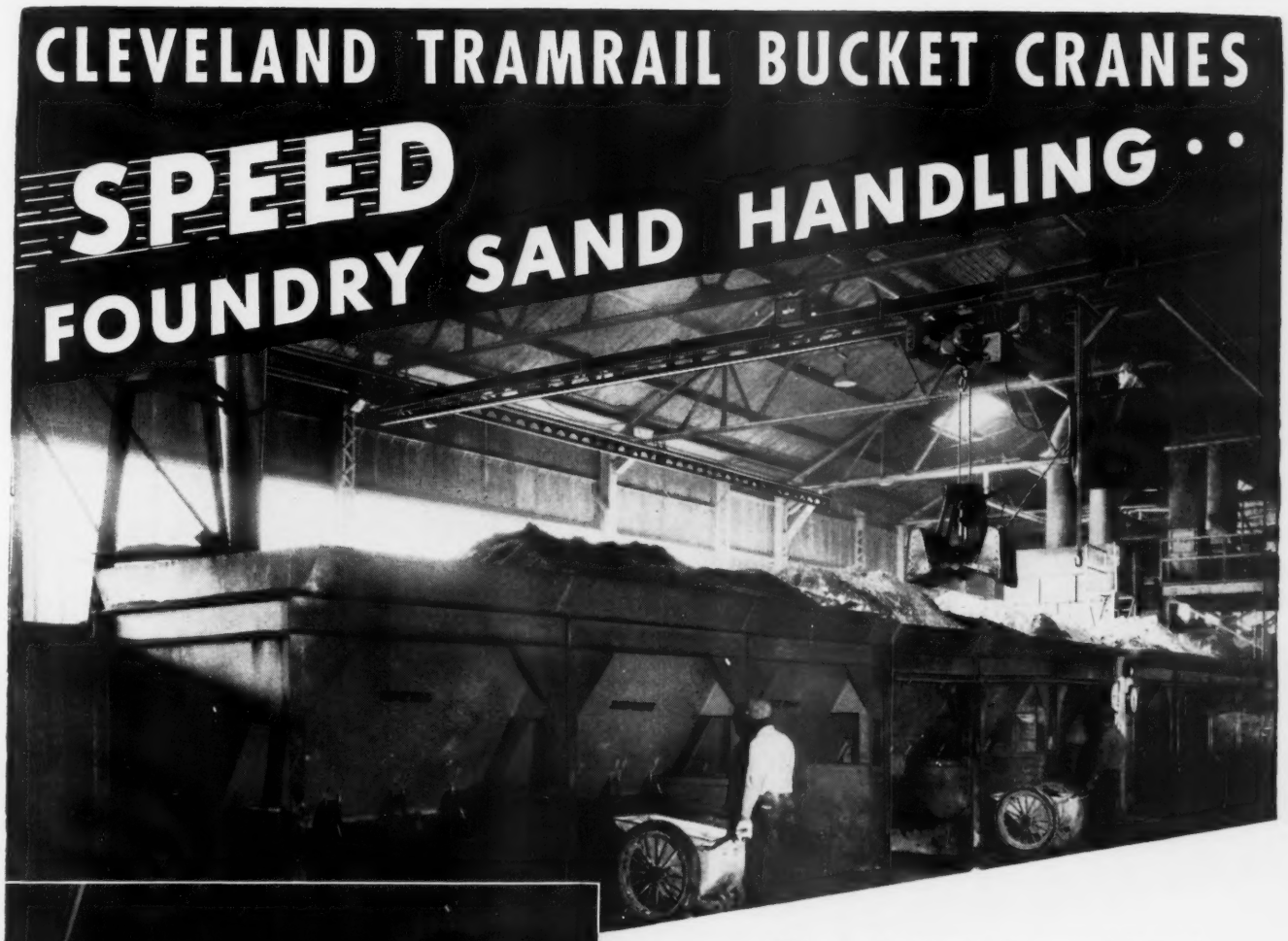
Saturday, Sept. 18, was given over to an open house for the industrial shops. Acres of foundries for ferrous and nonferrous castings were visited by thousands of people from all over the country. Castings made in these highly modern foundries range from some which weigh only a few pounds, to battleship propellers which weigh 22 tons and are over 20 ft in diameter.

The pattern shop is located in a four-story concrete and steel building in which each floor is 216 x 252 ft. Elevators provide access for yard workers and their materials. A blower system removes sawdust: When caps are removed from the vents, blowers automatically remove every

(*Concluded on page 74*)

CLEVELAND TRAMRAIL BUCKET CRANES

SPEED FOUNDRY SAND HANDLING ••



This crane has been operating successfully for 4 years, 24 hours a day. The single line grab bucket requires no motor and is of a type that eliminates most of the usual impact on crane. The bucket is easily detached when it is desired to handle loads with the crane hook.

The cranes are 44'-0" long and operate on two-track runways. They are controlled from either platform or floor by pendant push-button stations.

AN AVERAGE of nine 60 ton gondola cars of sand are handled every 24 hour working day with two Cleveland Tramrail Platform-controlled motorized cranes with ½ yard buckets in a large Illinois foundry.

Some of the sand is taken to storage and later transferred to bins. Other sand is taken to storage, then to drier and finally to bins, thus is handled three times with the cranes. As the sand is handled one to three times, it is evident that somewhere between 1000 and 1500 tons are handled every day.

The cranes, which are operated by both men and women, have served in this rigorous work for several years with need of only minimum maintenance.

GET THIS BOOK!

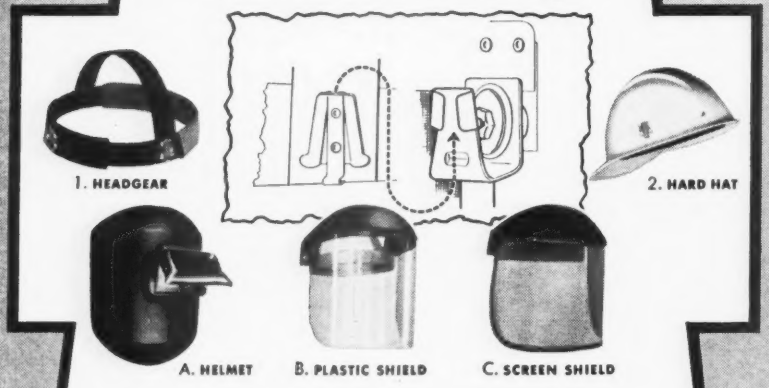
BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
3807 East 286th Street • Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

CESCO RIGHT... before your Eyes!

NEW Mounting



Assemble Your Own Combinations

Here's a way for you to save money on head, face, and eye protection equipment. Now you don't have to buy duplicate headgears or hats. If you need a helmet (A) and face shield (B), buy them along with only one headgear (1) or hard hat (2).

Items **A, B** and **C** can be used with either items **1** or **2** illustrated above so you can make six different combinations. The old-fashioned way you would buy a helmet and headgear, a shield and headgear, and so on until you had six combinations (twelve items) to do the same thing these five separate pieces will do.

The new CESCO Mounting has an easily adjusted tension spring to compensate for weight differences. Tilting mechanism permits easy raising and lowering. Wedge shaped brackets slide apart or together quickly, and lock securely.

Save buying extra parts . . . save money

On your next order specify CESCO interchangeable helmets and face shields.

They're—"*Right...before your Eyes.*"

Send TODAY

for CESCO literature and the name of your CESCO safety equipment distributor

CHICAGO EYE SHIELD COMPANY • 2324 Warren Blvd. • Chicago 12, Illinois

CESCO FOR SAFETY

OFFICES IN: Atlanta, Birmingham, Boston, Buffalo, Cincinnati, Cleveland, Columbus, Dallas, Detroit, East Orange, Houston, Indianapolis, Kansas City, Knoxville, Little Rock, Los Angeles, Louisville, Mexico City D.F., Milwaukee, Montreal, Peoria, Philadelphia, Pittsburgh, Salt Lake City, San Francisco, Spokane, St. Louis, St. Paul, Toledo, Tulsa, Wichita

(*Concluded from page* 72)

particle of sawdust. G. G. Peabody, master patternmaker since 1916 and an employee of the yard for over 50 years, retired a few months ago.

The extensive facilities at Mare Island are in striking contrast to a small foundry operated by a friend of mine in Nicaragua. My friend, R. W. Draper, is manager of Nicaragua Sugar Estates Ltd., Ingenio San Antonio. With over 4000 employees growing and processing sugar, it is the largest such project in Central America. A large amount of machinery of all kinds is used and is subject to repairs and alterations.

Top, left to right, are Adan Flores, molder foreman; Jose M. Obando, patternmaker; Humberto Gaitan, molder; and Rafael Valladares, shop foreman. Pit furnace and crucibles are shown in the foreground. Below, the crew pours babbitt-lined mill bearings

In a country where the nearest foundry is far away and transportation is poor, a small foundry and pattern shop must be operated on the plantation. Besides being manager of the sugar operations, Mr. Draper has a mechanical engineering background and is fully conversant with pattern, foundry and machine shop work. He has to instruct native molders and pattern men, who are shown in the accompanying photographs. Mr. Draper says, "It is really amazing what can be accomplished with men like these since we have little or no modern equipment, and only skill and enthusiasm keep the wheels turning."

PAUL LAWLER

1435 *Imperial*
San Diego, Calif.

Placing lightweight shavings and chips near discharge end provides a cushion that protects the furnace lining from heavier scrap.

LINK-BELT Oscillating Conveyor proves highly effective charging induction furnace at New England foundry

BY installing a Link-Belt Oscillating Conveyor to charge their large capacity electric induction melting furnace, this New England non-ferrous foundry achieved two important advantages:

(1) An entire furnace batch (2½ tons) of brass mill scrap, chips and shavings can be loaded on the conveyor at one time—freeing the operator for other duties.

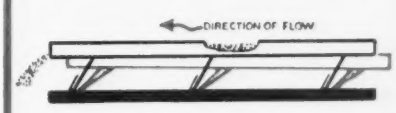
(2) Positive Action (see box) smooths concentrated loads to a uniform, continuous flow at the furnace.

Over a thousand Link-Belt Oscillating Conveyors are operating successfully in foundries. They find additional use separating sand and castings when the feed end section has a perforated plate bottom that acts as a shakeout.

Remember, too, you can now save time and money because 36 in. wide sections are carried in stock. These pre-engineered sections can be built up to any desired length.

Whether you need a single machine or a complete sand and castings handling system—call on Link-Belt. Our engineers will work with you and your consultants—help you get the finest in mechanized facilities.

How Positive Action moves materials



Positive-action, constant-stroke eccentric provides a powerful, yet gentle upward and forward oscillating motion. Large volumes of material are moved in a uniform, continuous flow, regardless of surges. Resonant spring action of resilient legs cuts power requirements to a minimum.

LINK-BELT

CONVEYORS AND PREPARATION EQUIPMENT

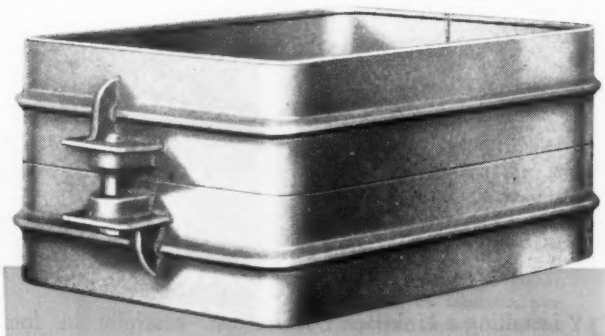
13.552

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Sydney; South Africa, Springs. Representatives Throughout the World.

Look! Here's an old Sterling Style "E" Flask — a veteran of 35 years' service.

No... the Whole Truth is NOT in the Holes!

It's that rugged reinforcing rib that adds such long life to Sterling Foundry Flasks. In spite of 35 years' service, the old flask shown here *could* be used if necessary. Even though holes are worn through the sides, those reinforcing ribs still hold the flask rigidly intact. You wouldn't expect to use a flask in that condition, but this exclusive Sterling feature emphasizes the superiority that has made Sterlings the No. 1 Foundry Flasks all over the world.



New Sterling Style "E" Flask ready to go into 35 years, or more, of tough foundry service.

Sterling

WORLD WIDE SERVICE

Write for Catalog!

STERLING WHEELBARROW COMPANY

Main office and plant • MILWAUKEE 14, WIS., U. S. A.

Branches and Dealers in Principal Cities

Subsidiary Company: STERLING FOUNDRY SPECIALTIES LTD.
LONDON • BEDFORD • JARROW-on-TYNE, England

FOR NEARLY HALF A CENTURY *manufacturers of* FOUNDRY EQUIPMENT

A 8049-1P.

Why Take Chances?

Today's successful foundryman is greatly concerned with the attitude of the community toward his organization. He realizes that the citizens of a town or city must have confidence, respect and pride in his industrial organization if many problems connected with securing an adequate working force are to be solved. Furthermore, the attitude of employees' families and neighbors toward the company governs to a large extent the feeling of satisfaction and contentment that may be cultivated among workers at the plant.

Greater attention to the development of better community relations has been noted in recent years. While managements of some foundries have done a more intelligent and skillful job than others, it is believed that most organizations have made some effort in that direction.

Many companies have found the open house the best method of telling people about the foundry and its operation. Plants are made spick and span (one of the important by-products of the open house), displays showing details of manufacture and samples of products are prepared, and an enthusiasm to do a good selling job is developed among the plant personnel. Usually families of employees are entertained first so that mother and the kiddies can see where daddy works. Then various civic groups are welcomed to the plant, including the clergy, service clubs, teachers and school children. Some companies welcome school children, college students and other groups at times when special open house programs are not under way.

While open house programs provide an excellent means of furthering good community relations, they also offer a source of potential danger. An illustration of this hazard was supplied recently when a friend sent us a clipping from a fairly large metropolitan daily newspaper. Headed "Foundry Visited," the story carried a picture of 35 fifth-grade children watching a molder pour a hand ladle of metal into a mold. The intent look on the faces of the children would indicate they were captivated by the industrial process unfolding before them.

But a good look at the photograph should send shivers down one's spine. Everything is wrong. The molder is naked from the waist up. He has no goggles, no gloves, no leggings. But worst of all, those youngsters are lined up only a few feet from the mold and hot metal and are looking down at the operation. One little splatter of metal, and—disaster. Kids could lose eyes or suffer other physical injury, and the industry could acquire some exceedingly damaging publicity.

Let's have more and better open houses, more plant visits and greater attention to community relations. But let's see that we practice safety in our plants, and protect our visitors to the full extent.

Frank G. Steinebach

Editor

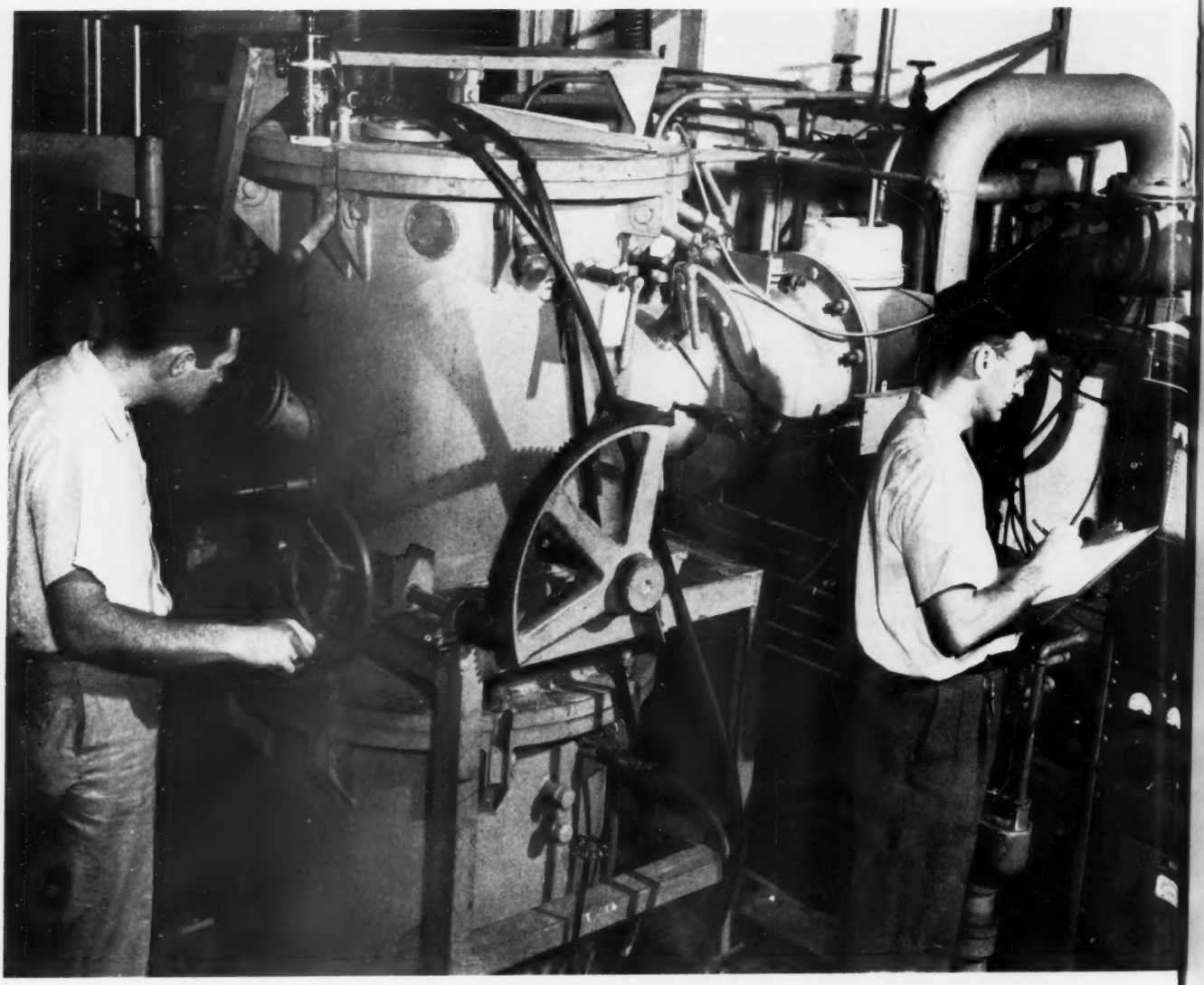


Fig. 1—Naval Research Laboratory research equipment for melting and casting metal in a high vacuum. It eliminates gas, but is not practical for foundry operations

A Practical Method for

VACUUM DEGASSING

OF NONFERROUS METALS

By HAROLD F. BISHOP
Head, Casting Section

EDWARD E. LAYNE and WILLIAM S. PELLINI
Metallurgist *Superintendent*
Metallurgy Division
Naval Research Laboratory
Washington

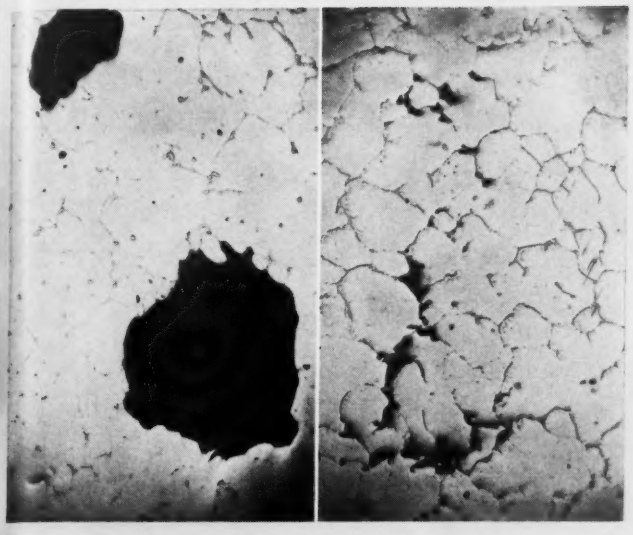


Fig. 2—Examples of globular (left) and interdendritic (right) types of porosity. About 25X

POROSITY IN CASTINGS

Porosity in nonferrous castings results from either inadequate feeding or the presence of gas in the melt. Depending on metal characteristics and casting conditions, the resulting porosity may range from a globular type which presents a poor surface on machining to an interdendritic type which provides passages for leakage under hydraulic or gas pressure. In order to produce sound, pressure-tight castings it is necessary that adequate feeding be provided and that the gas content of the melt be reduced to low values.

It is demonstrated that vacuum degassing treatments such as may be applied in practical foundry operations by the use of mechanical pumps effectively eliminates the gas problem. The high quality metal resulting from the degassing treatment produces sound castings when due consideration is given to proper risering and gating practices.

NONFERROUS castings are subject to porosity defects varying from the globular type which does not affect pressure tightness but presents a poor surface after machining, to the interdentritic stringer type, which provides passages through which leakage can occur.

Fig. 2 illustrates the appearance of globular and interdendritic porosity. Globular porosity is due to the evolution during solidification of gas dissolved in the liquid metal. Interdendritic porosity may be due either to gas or to a deficiency of feed metal in metals which freeze in a mushy manner —that is, with late development of a solid skin.

Because of these dual possibilities of the origin of interdendritic porosity, it usually is difficult to decide on the remedy when its presence is observed

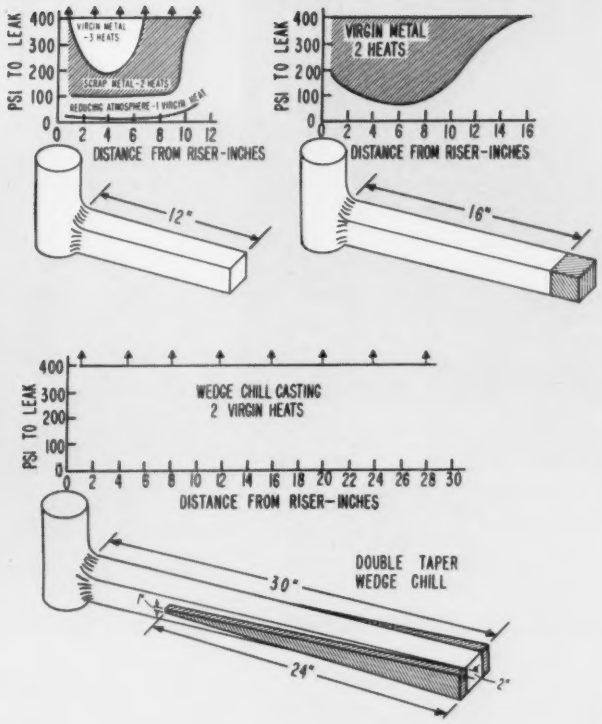


Fig. 3—Testing pressure tightness of ¼-in. thick slices from gun-metal bronze bars. The accompanying charts indicate the effects of various degrees of directional solidification

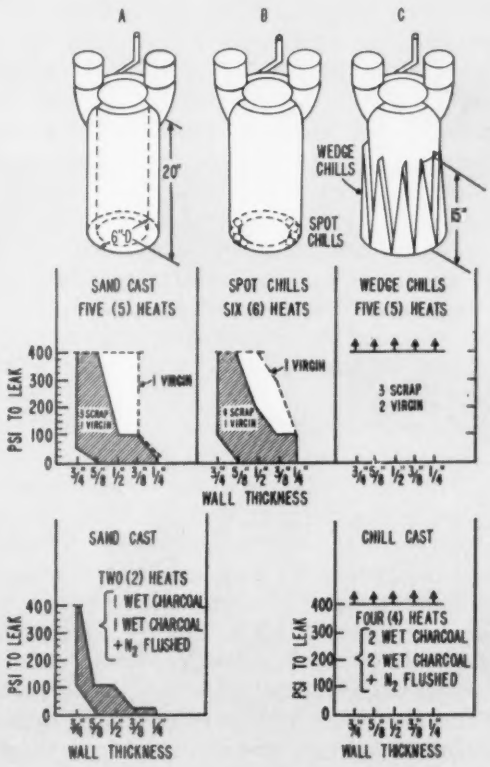


Fig. 4—Results of testing pressure tightness versus wall thickness of bushings. Tests were with gassed and conventional metal and different degrees of directional solidification

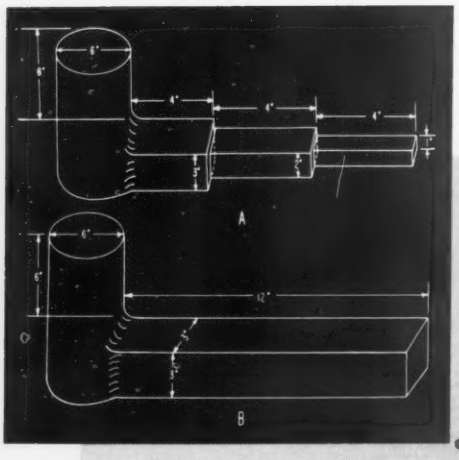


Fig. 5—Casting A and casting B were designed, respectively, with strong and weak directional solidification

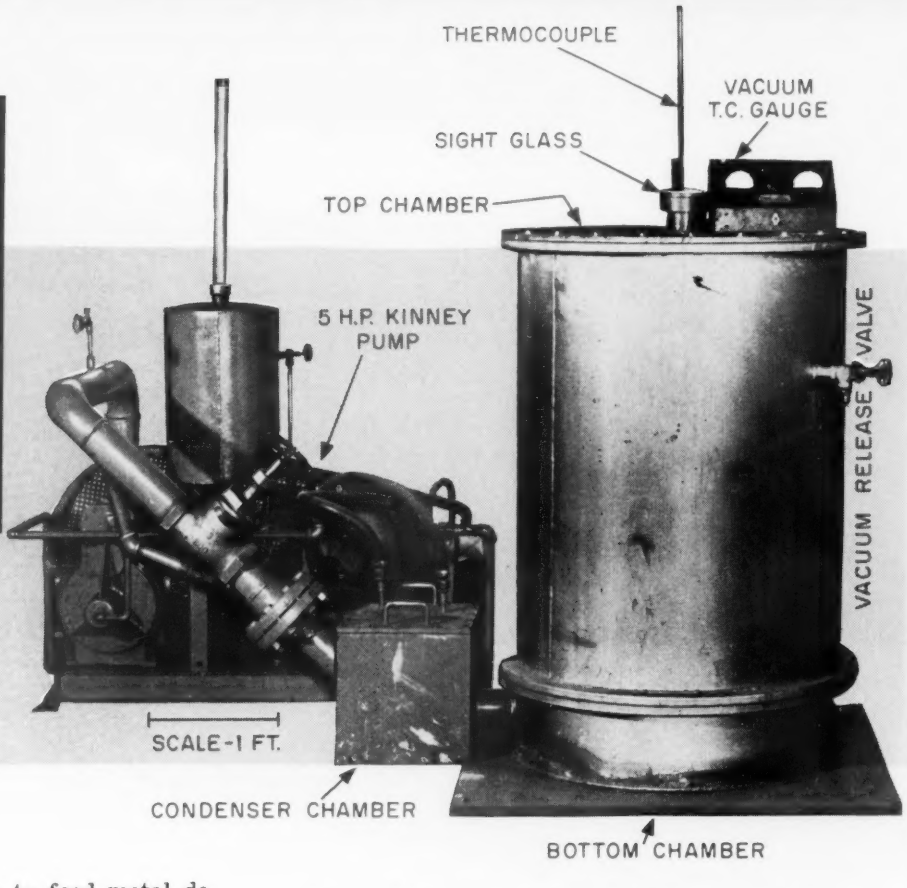


Fig. 6—This vacuum type degassing unit built at the Naval Research Laboratory is suitable for practical, commercial foundry operations

in a given casting. If it is due to feed metal deficiency, the remedy involves increasing the degree of directional solidification by padding, chilling or additional risering. If gas is the cause, however, the remedy involves lowering the gas content of the melt. For cases involving both effects in combination, both remedies must be applied.

In general, the nonferrous foundryman has underestimated the difficulty of developing conditions required for feeding to complete soundness. Consequently, he has tended to approach the problem of eliminating porosity primarily by improving melt quality either by modifying melting practice or by gas flushing or by both. Recent work at the Naval Research Laboratory[1] has demonstrated that the feeding range of risers on nonferrous castings is short as compared to that of ferrous metals and that the degree of directional solidification required for feeding to soundness is much greater than generally realized.

The effects of various degrees of directional solidification, obtained by variation in the severity of chilling, on the feeding of gun metal bronze are illustrated in Fig. 3 by experiments with bar castings. To evaluate casting soundness, transverse slices ¼-in. thick were removed from the bars at 2-in. intervals along their lengths and tested under hydrostatic pressures up to 400 psi. Slices from unchilled bars up to 12 in. long could withstand 400 psi pressure without leakage, but only when a virgin metal charge was used. End chills caused little improvement in feeding. Consistent 400 psi pressure tightness could not be obtained in bars 16 in. long. However, when a high degree of directional solidification was obtained by means of wedge-shaped side chills, all slices removed from bars even 30-in. long could withstand pressures of at least 400 psi without leakage.

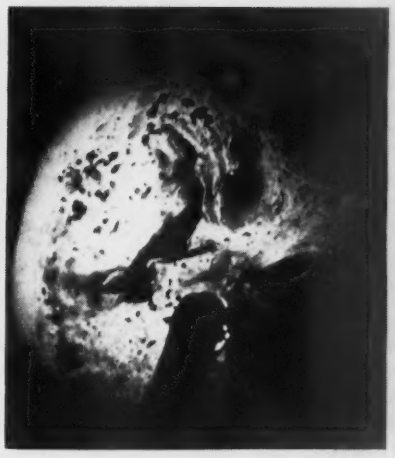
Similar findings were noted for bushings, Fig. 4, which were tested hydraulically after each of several reductions in wall thickness by machining. Because of an insufficient degree of directional solidification, unchilled (A) and bottom chilled (B) bushings leaked badly after the outer surfaces were removed, even though they were cast with metal melted under conditions corresponding to those of best commercial practice. On the other hand, application of wedge-shaped chills (C) resulted in bushings which did not leak at hydraulic pressures over 400 psi, even after being machined to a wall thickness of ¼-in. Since the high degree of soundness in wedge-chilled castings was obtained even when badly gassed metal was used (melted under wet charcoal), it is obvious that strong directional solidification may overcome the effects of both shrinkage and gas.

It is generally believed that small amounts of gas are beneficial to the pressure tightness of nonferrous castings. The hypothesis is that "just enough gas" will, under conditions of a small deficiency of feed metal, break up the continuous interdendritic shrinkage passages into isolated shrinkage regions and obviate the need for strong directional solidification. If this belief is correct, the practical problem exists of controlling the gas content so that it is just sufficient for this purpose.

If the gas content is insufficient, it will not accomplish its purpose; if too great, it will increase the total void volume. From a practical viewpoint, it is difficult to envisage how the foundryman could determine the correct level of gas content for any

Fig. 7—Vacuum chamber is open (a crane lifts the top), and the crucible of metal is in place for degassing operation

Fig. 8—At left, view through sight glass shows turbulent surface of melt during evacuation treatment. At right, dross accumulation from sweeping action of gas evolution



given casting. It would seem most practical and direct to combine the approaches of developing adequate directional solidification and low gas content, for then the balancing of gas content against feed metal deficiency is not a problem.

Research Type Degassing Equipment—To evaluate the relative effects of gas content and directional solidification on the development of porosity, metal must be available that has been melted without gas. This may be accomplished by the use of high-vacuum equipment* like that shown in Fig. 1. This equipment was assembled at the Naval Research Laboratory for research studies and is not suitable for practical foundry operations.

For the research studies, aluminum-4 per cent copper and aluminum-7 per cent silicon alloys melted in the high-vacuum equipment were cast into two shapes, Fig. 5, which have designs such that wide differences in directional solidification are represented. The molds for these shapes were made of a silica sand bonded with bentonite and water and fired at 1300° F. The fired molds were placed in the vacuum chamber and therefore were degassed during the melting operation.

In the absence of gas, casting A, featuring strong directional solidification, was completely sound. Casting B, with weak directional solidification, was poured under the same conditions. It contained porosity which was necessarily shrinkage porosity resulting from the inability of the feed metal to flow through the interdendritic channels. When casting A was poured with metal melted in the atmosphere, porosity developed in either the heavy section alone or in both heavy and thin sections, depending upon gas content and pouring temperature. A great number of such castings was poured, and no case of complete absence of porosity was observed when the metal was melted in the atmosphere and poured without further treatment. It may be concluded that porosity in the step bar was due to the presence of gas.

During the course of such basic research in-

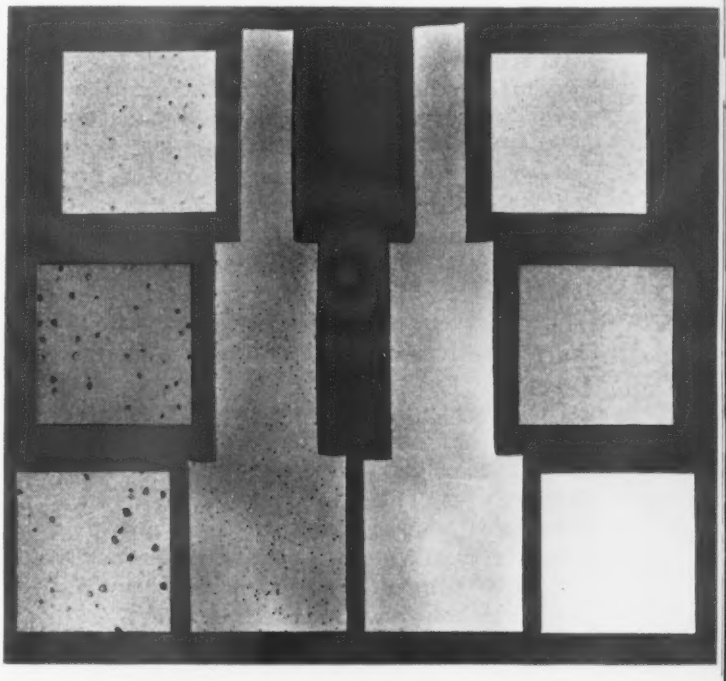


Fig. 9—Sections of Al-7% Si casting from heat poured at 1350° F prior to (left) and after (right) degassing. Square pieces are enlargements of respective positions

* This equipment permits melting under vacuum levels of 0.0001 mm of mercury. Atmospheric pressure is designated as 760 mm of mercury (height of mercury column which is supported by atmospheric pressure); therefore 0.0001 mm signifies that the pressure at this level of vacuum is approximately 1/7,600,000 of an atmosphere. To develop such a high vacuum, oil diffusion pumps are required; mechanical pumps alone are capable of developing only vacuum levels in the order of 0.1 mm in tight systems containing molten metal (1/7600 of an atmosphere).

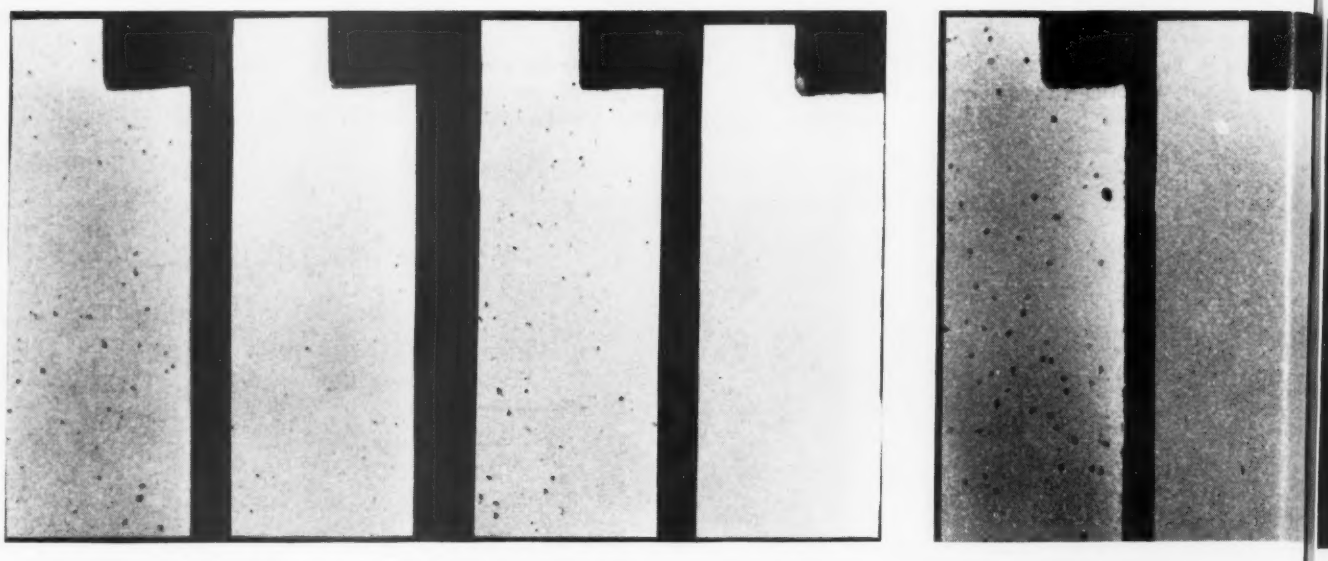


Fig. 10—Before and after views of effects of degassing on aluminum alloys: Left to right, 8% Cu poured at 1250°F; 4½% Cu, 1250°F; 7% Si, 1300°F; and (next page) 4% Cu, 1% Si, 1300°F

vestigations, which are still under way and will be reported at a later date, it became evident that effective degassing could be obtained with vacuum levels in the range produced by mechanical pumps. This finding indicated that the gas problem could be eliminated in commercial foundry operations by the use of a simple foundry degassing unit, thus leaving only the problem of developing adequate directional solidification in order to obtain complete soundness. The significance of these findings is that expensive vacuum installations with diffusion pumps and extremely tight systems are not necessary to obtain the degree of degassing required in commercial foundry practice.

NRL Foundry Type Vacuum Degassing Unit—The foundry type vacuum degassing unit built at NRL is shown in Fig. 6. The upper part of the vacuum chamber can be lifted from the base by a crane to permit placing and removing a crucible of metal, Fig. 7. A neoprene gasket forms a vacuum seal at the joint. The weight of the top part of the chamber suffices to maintain this seal, and bolting is not necessary. Vacuum is obtained in the chamber with a 5-hp Kinney pump. Between the pump and the vacuum chamber is a water-cooled cold trap which condenses elements, such as zinc and magnesium, which may distill partially from the melt.

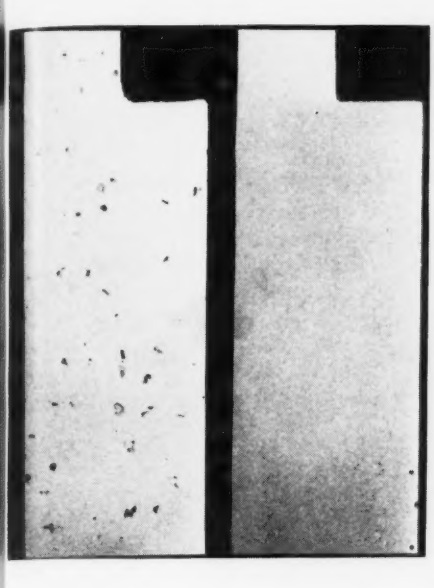
The degassing chamber is equipped with a sight glass for observation of the action of the molten metal within the chamber, a thermocouple tube which projects into the crucible of the molten metal, a pressure gage which reads pressures between 0.05 and 5.0 mm, and a valve through which air can be allowed to enter the chamber after the metal has been degassed.

In operation the top section is raised with a crane, and a crucible of molten metal is placed on a refractory stool. Then the top section is lowered in position for degassing. Within one or two minutes after the pump has been started, pressure within the chamber falls from 760 mm (atmospheric pressure) to about 3 mm, a drop which causes a boil within the melt as the gas is evolved. As degassing progresses, the boiling action diminishes and the pressure drops gradually.

After 10-15 minutes, the surface of the melt becomes quiet and the pressure has fallen to approximately 0.2 to 0.3 mm, at which time the metal is considered ready for pouring. The pump then is stopped, the air inlet valve is opened, and the crucible is removed from the chamber. Prior to pouring, the metal in the crucible is skimmed to remove dross which was flushed to the surface of the melt by the evolution of gases. Fig. 8 shows a view through the sight glass (left) of the turbulent surface of a melt during the evacuation treatment and (right) the large amount of dross which usually accumulates on the surface of the metal. Without the vacuum treatment, this dross is entrained in the castings.

The efficiency of the scrubbing action of the outflowing gas occurs because gas in the melt is enlarged greatly in volume because of the low pressures within the chamber. For example, 1 cu in. of gas at normal pressures becomes 700 to 800 cu in. at pressures developed in the degassing unit. Thus the scrubbing action of the gas under vacuum is equivalent to the passage of a large volume of gas at atmospheric pressures.

A degassing time of approximately 10 to 12 minutes is sufficient for a No. 70 crucible of aluminum alloy. The loss in temperature during the holding time is relatively small because of the efficient insulation obtained in a vacuum. For example, if it is desired to pour aluminum at 1250° F after a 10-minute degassing period, the metal should be removed from a gas-fired furnace at approximately 1275° F and from an induction furnace at approximately 1550° F. The reason for this difference is that the crucible remains at or below metal temperature in (*Please turn to page* 242)



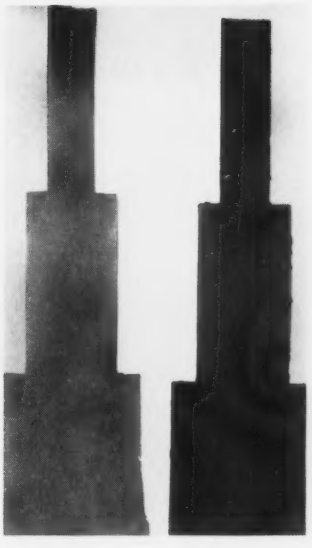


Fig. 11—Left to right, degassed pure copper and monel castings

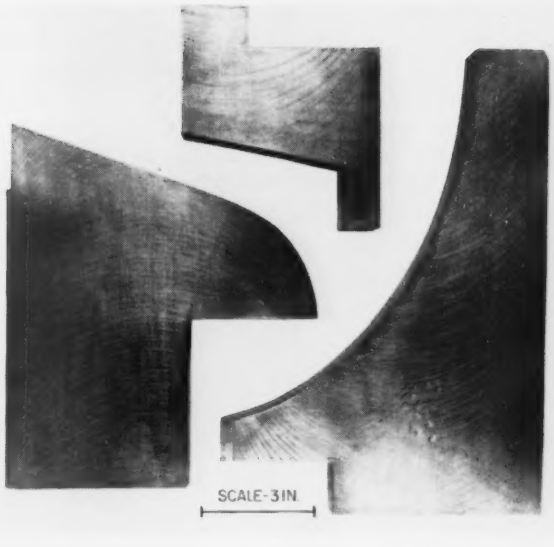
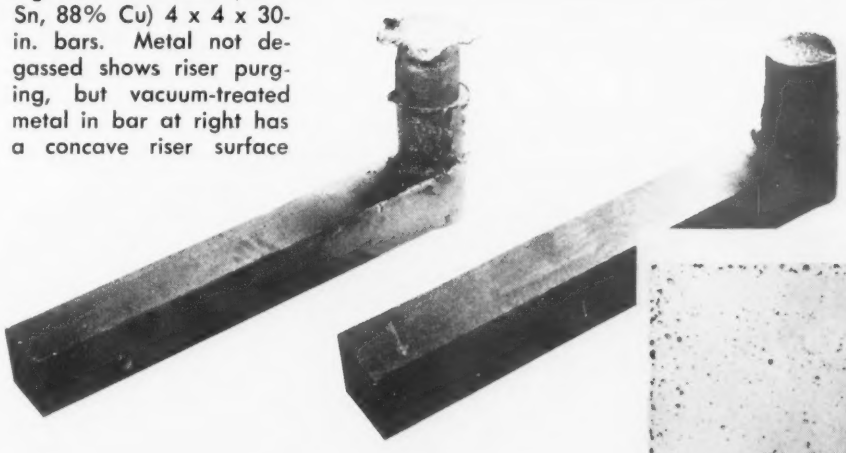


Fig. 12—Machined high conductivity copper castings from degassed metal

Fig. 13—Tin-bronze (12% Sn, 88% Cu) 4 x 4 x 30-in. bars. Metal not degassed shows riser purging, but vacuum-treated metal in bar at right has a concave riser surface



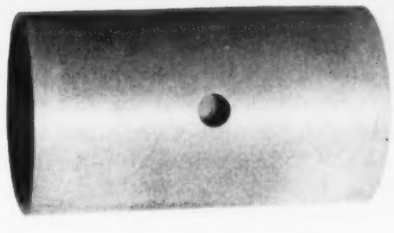


Fig. 14—View shows examples of typical aluminum alloy castings illustrating complete freedom from defects, attained by use of metal treated in a vacuum

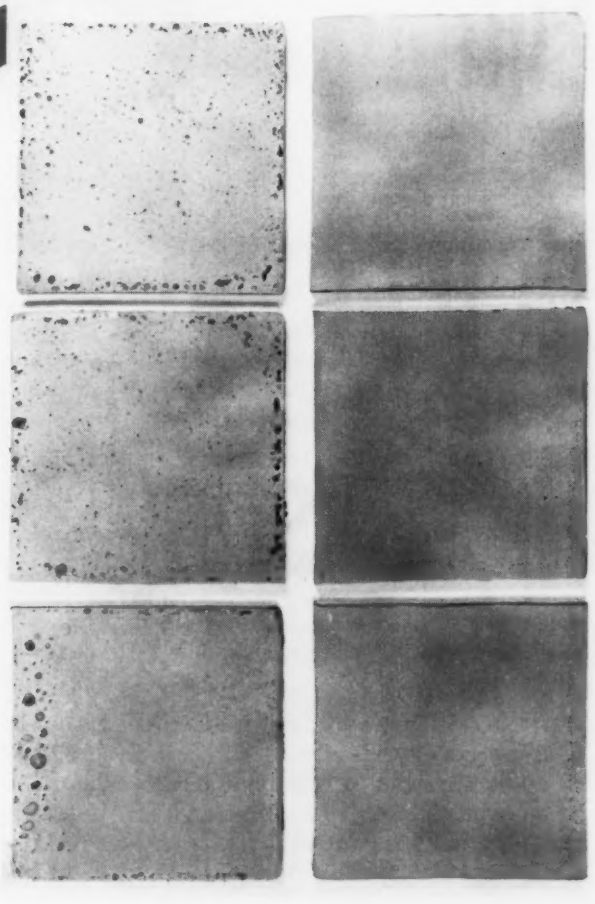


Fig. 15—Sections shown here were removed near riser, end and center of not degassed (at left) and degassed (at right) bars shown in Fig. 13

Eliminating Defects in Die Castings

By W. M. HALLIDAY
Consultant
Southport, England

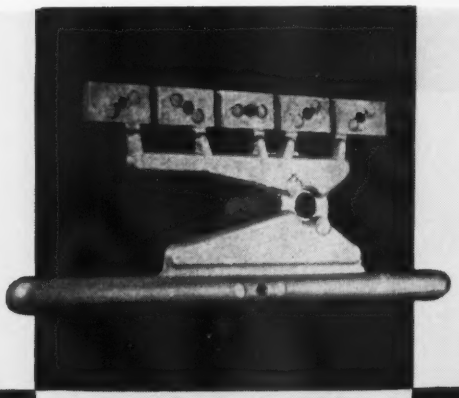


Fig. 1 (left) — Minimum of parting-line flash is exhibited by these castings, shown here as they came from die

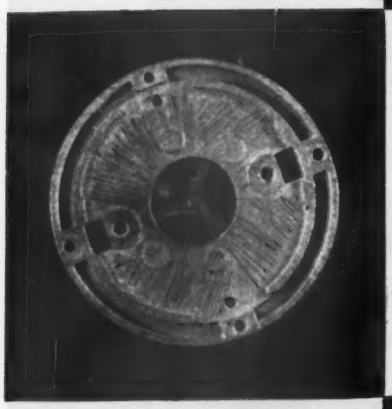


Fig. 2 (left)—Produced from single-impression die, typical aluminum pressure die casting displays bad flow marks

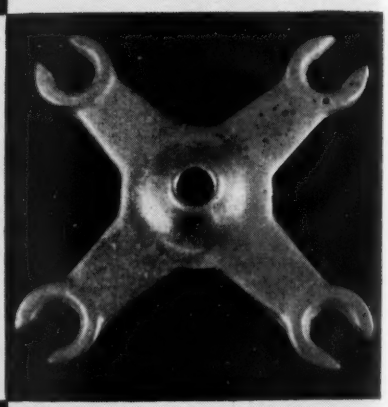


Fig. 3 (right) — Insufficient air venting is cause of typical effects of trapped air porosity in this part

Fig. 4 (left) — Porosity caused by incompletely filled cavity is illustrated by top casting. Each is zinc-base alloy

This article deals with the diagnosis and elimination of such common defects in die castings as parting-line flash, flow marks and various types of porosity. The author takes up each separately and suggests adequate remedies

IN SOLVING die casting problems, all possible causes of defects should be checked accurately by examination of castings, dies, working conditions and the alloy. Each cause should be judged according to its relative importance and effects. Next, possible causes should be eliminated in systematic fashion, commencing with the one believed to exert the maximum adverse effect. Appropriate changes should be applied successively until the irregularity has been corrected.

This article deals with common defects in die castings, defects selected because of the difficulty of diagnosing and eliminating them. For each undesirable feature, the outline gives steps in an orderly diagnosis and determination of remedial treatment.

Flash—One of the most frequent and troublesome faults in pressure die casting is the formation of thick flash. Some degree of flash is unavoidable, of course, around the exterior of a casting at the

main die parting joint.

With first-class die design, sound construction and good working conditions, parting-line flash usually need not be more than 0.003-in. thick. This flash can be severed readily by finger pressure, and the resultant scar is hardly noticeable. Flash of this character can be removed economically by ordinary tumbling methods, without trimming dies or machining.

If the flash is more than about 0.007-in., trimming by shearing die is necessary, necessitating handling of each casting and the danger of a prominent scar line.

Magnitude of flash on a die casting depends on the closeness of seal between the die blocks at the instant of injection. If the die blocks cannot be sealed so that a gap of less than 0.001-in. remains at all points around the critical edges of the die cavity, flash will occur.

Flash Causes Other Troubles

Thick flash at the parting-line location may be from 0.005 to 0.020-in. thick. Removal of such flash is difficult by usual die trimming methods. Critical dimensions on such heavily flashed portions intersected perpendicularly by the parting line joint may suffer serious variations. Thick flash may impede ejection of the casting from die cavities by hanging, thus reducing working speed of the die.

Formation of thick flash also may cause stiffened working of the die mechanism. This situation arises because particles of casting alloy penetrate into bearings for cores, ejector-rods, slides, etc. Heavy flash may completely stop air-vent channels across the die parting surfaces and lead to trapped-air porosity. Continuous operation of a die forming heavy flash may permit metal leakage across the parting-joint. Prolonged overloading, wear, binding or over-stressing can damage working mechanisms.

Fig. 1 shows an example of die castings produced with a minimum of parting-line flash. It depicts two castings connected to the runner-sprue waste, as taken from the die, before any trimming. The longer casting, with a single cored hole in the center, required a particularly good surface finish for chromium plating later. Note that only two small-diameter ejector rods are employed to remove this casting from the stationary core and its cavity. Ejector rods are situated upon the runner waste material on each side of the hollow sprue stalk.

These castings, together with runner and gates, occupy a considerable surface area in the die, but the negligible flash shows that a uniform, close seal has been maintained on the critical portions of the die parting joint.

Two kinds of flash generally are associated with die castings: Parting-line flash and collar flash at points where cores, slides or ejector rods impinge on walls of a casting. More prevalent and more serious, parting-line flash may arise from a number of causes. Chief of these are listed below with diagnosis and remedial procedure.

Thick Flash at Die Parting Joint—*Cause* 1: Insufficient pressure for locking die blocks. The locking pressure imposed on die blocks at closure always must be appreciably greater than the internal (opening) force caused by the impact of the molten alloy charge against cavity walls, runner channels, etc. The latter force is determined by the injection pressure in psi multiplied by the total projected surface area of cavities, runners, gates, etc.

With very large castings which necessitate an intricate runner layout or multiple impression dies, the projected surface area exposed to the alloy charge easily may be too great. The maximum locking pressure is determined by the clamping mechanism of the machine. Where this cause is suspected, residual locking pressure available should be determined accurately.

Effects: Flash due to this cause is almost uniformly distributed around all sides of castings, runners and gates and is almost equally thick at all points. Successively produced castings suffer from similarly located thick flash, and only occasional pieces form much thinner or more extensive flash. The flash usually projects a considerable distance beyond the edges of castings and runners, and the perimeter may be very uneven.

Accompanying this condition may be a serious leakage of molten alloy across the die parting joint at the instant of injection. Excess alloy may travel into adjacent portions of the die mechanism around cavities and sliding cores, ejectors, slides, etc.

Describes Method of Attack

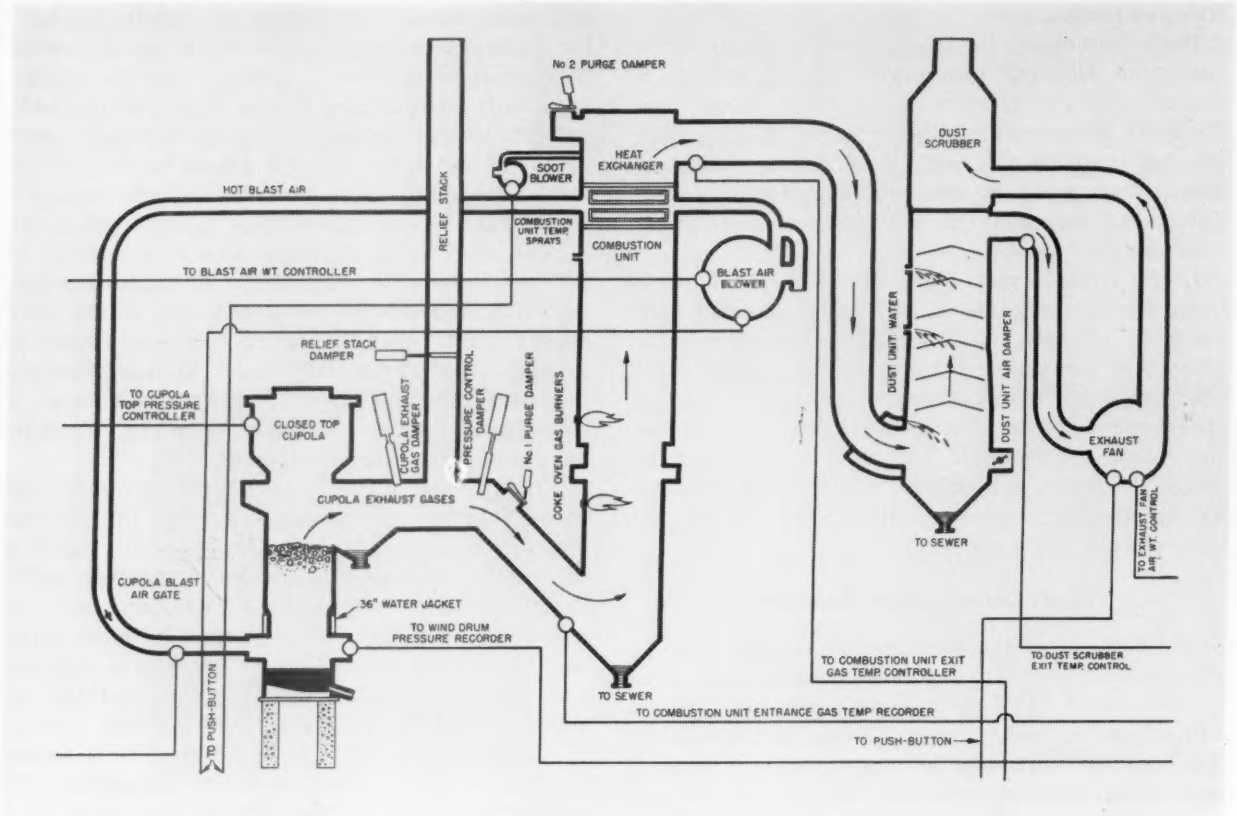
Remedy: A few castings should be produced at a lower injection pressure, 10 to 15 per cent under normal operating level. Thickness and extent of flash on these castings should be measured for comparison with the flash on castings produced under normal pressure. If flash thickness is less, insufficient die locking pressure is the cause, and clamping pressure on machine tie-rods and platens should be increased. Before further castings are made, insure that no extraneous influence is arresting proper closure of dies.

Locking pressure on dies should be increased gradually until flash has been reduced to normal. It is essential to observe the effects of additional clamping pressure on die blocks to avoid distorting the blocks or stiffening up vital working mechanisms in the die.

Cause 2: Unequalized locking pressure on die blocks at closure. Nonuniformly applied locking pressure on dies may cause thickened flash.

Effects: If the magnitude and extent of flash thickness vary with separate castings and around each individual casting, the trouble may be insufficient closure of the die blocks at one side because of badly distributed locking pressure.

This condition should be suspected if, at the latter state of die closure, before final seal, the movable platen moves with extreme sluggishness or if severe binding and dragging is noticed on main dowels of the die. There also may be some leakage of molten alloy at one side of the die parting joint. (*Please turn to page* 225)



Schematic flow diagram of the closed system for the hot blast cupolas

CLOSED-TOP CUPOLAS

End Air Contamination

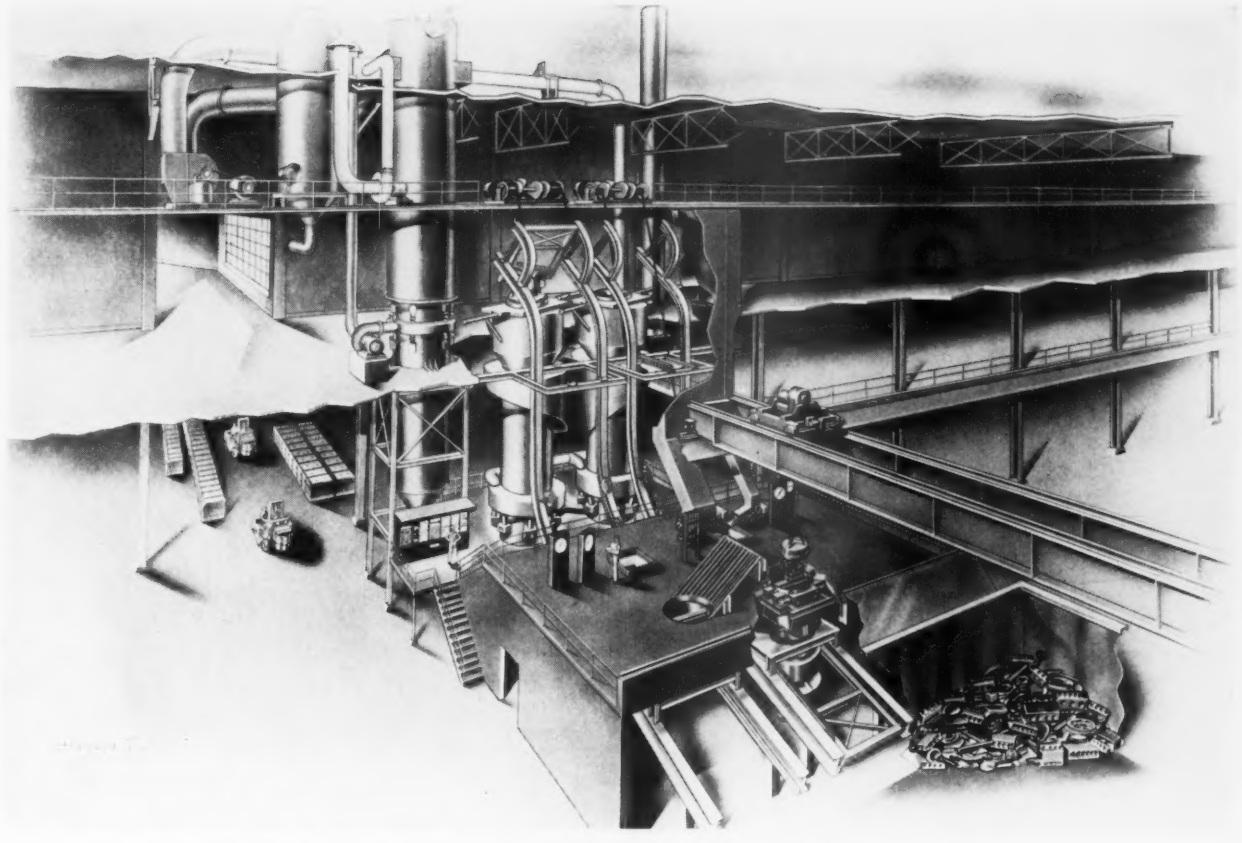
By ROBERT H. HERRMANN
Associate Editor

HIGH operating efficiency plus almost complete elimination of atmospheric contamination due to stack discharge is claimed for four hot-blast, sealed cupolas with wet impingement-type collectors installed at the Ford Motor Co. Dearborn Iron Foundry in Dearborn, Mich. The cupolas, which have been installed about one year, are arranged in groups of two, each group being served by one heat exchanger and fly ash collector.

These 108-in. cupolas are sealed completely at the top and are water-cooled at the melting zone by a series of eight hollow metal segments 36 in. high and 3 in. thick around the periphery. The cooling segments are covered by a blown-on monolithic lining. Conventional cupola block is used elsewhere in the cupolas for lining to 78 in. ID.

Cupolas are charged through the top. When the charging bucket seals the top, two split cast iron doors are moved horizontally by air cylinders to provide the opening for the charge. Gases leave the cupola stack near the top through a brick-lined flue which leads to the bottom of the recuperative hot blast system. A second flue carries gases from the top of this unit to the bottom of the wet dust collector, cleaned gases being drawn from the collector by an exhauster and discharged into the top of the collector where additional entrained moisture is removed. The gases then are discharged to the atmosphere.

Normally the cupolas are operated for 16-hr periods, turning out 27-28 tons of iron per hour on an 8½ to 1 iron-coke ratio. Occasionally, as production demanded, they have been operated satisfactorily on higher ratios and consequently



Three dimensional drawing of the charging, melting and dust arresting units

higher melting rates. They are continuous pour, front slagging units. Tapping temperatures average 2800° F. One of the advantages claimed for the cupolas is that adequate carbon control can be obtained in the melt with the use of a higher than average percentage of steel in the charges, eliminating the use of some pig iron. In addition to closer carbon control, silicon losses are at a minimum—less than 1 per cent.

Chemical analysis of the iron produced is 3.25-3.50 C, 2.00-2.40 Si, 0.70-1.00 Mn, 0.20-0.40 Cr, 0.12 max P and 0.15 max S. This iron has a brinell of 179 to 235, tensile strength of 35,000 lb nominal and deflection strength of 2400 lb nominal.

Use Skip Hoist for Charging

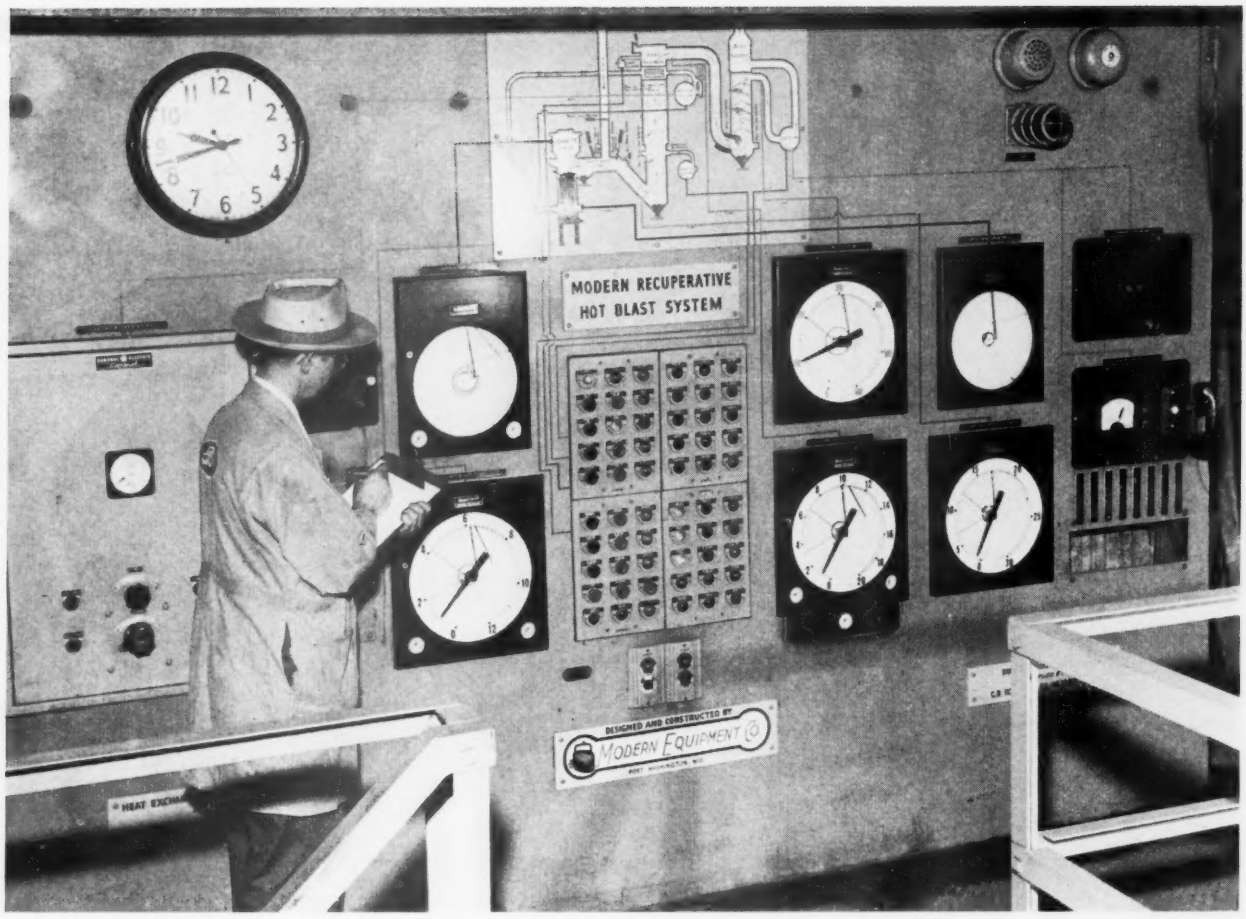
A skip-hoist unit with cone-bottom bucket is used for charging. The 5000-lb metal charges, consisting of 71 per cent pig iron and home scrap, 25 per cent steel scrap and 4 per cent silvery pig, are made up in a weigh hopper with a magnet-equipped bridge crane. Various weights are shown on a scale dial watched by the crane operator.

Weighed metal is dropped from the weigh hopper through bottom gates into the charge bucket after it has been lowered on the skip-hoist rails into position.

By pushbutton control of an electric cable hoist the operator raises the charging bucket along the skip-hoist rails to a point under a second weigh hopper, where the 600-lb coke and 150-lb limestone charges are added to the 5000-lb charge. Coke and limestone are fed from separate bins by chutes to a point above this weigh hopper and are shaken into the hopper by vibrating feeders.

When the bucket continues its ascent it engages a steel cover and lifts it off brackets located between the hoist rails. Spur rails near the top of the skip-hoist track on which the rear wheels of the charging bucket carriage ride are curved in such a manner that the bucket is carried forward and down over the top of the cupola. At this point a canvas skirt around the bucket shell enters a trough of water around the top of the cupola to form an effective seal against discharge of cupola gases. A steel hoop is bolted to the bottom edge of the canvas to keep it circular and insure proper fitting into the water trough.

When the seal has been effected and the bucket shell is resting on its support, the cupola doors are opened for a predetermined length of time to permit the bucket cone to be lowered and the charge dumped. The water seal and the loose bucket top which had been picked up previously prevent escape of cupola gases and fly ash to the atmosphere. After the cone bottom has been raised to the bucket shell, the cupola doors complete their cycle and close, and the bucket descends along the skip-hoist rails, depositing its cover on the brackets and coming to rest under the metal charge weigh hopper.



Control panel for each pair of cupolas. Below telephone at extreme right is an opening where eight test streams of cooling water can be observed

The entire cycle of operations is automatic and is controlled in sequence by a series of limit switches.

To insure against charging too soon, a stock-line indicator is provided which consists of two air cylinder "probes," entering the stack from the sides. If these encounter an obstruction, indicating that the cupola is full, the charging hoist is stopped and remains inoperative until the probes indicate room in the cupola to receive the charge. The "load" cycle control button then reactivates the hoist.

Stack gases from the operating cupola pass through the remaining parts of the system. The inoperative cupola is closed from the system by an exhaust gas damper. Gases enter the bottom of the heat exchanger combustion unit at a temperature of 1000° F or less. In their upward travel they pass a series of gas-fired pilot lights which ignite flammable gases which are not already aflame. Temperature in the combustion chamber is held between 1200 and 1500° F by water sprays located just under the heat exchanger tubes at the top of the unit.

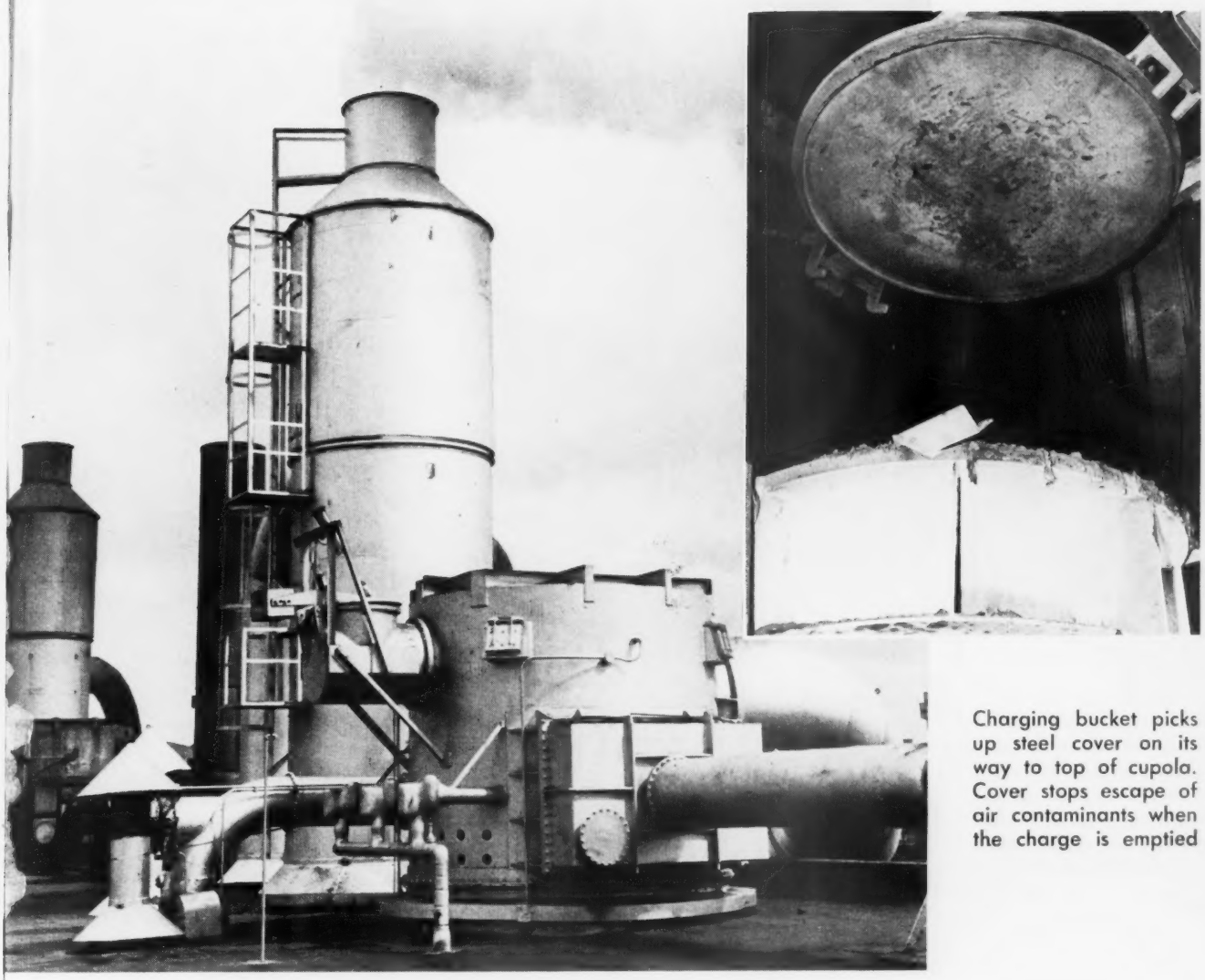
Blast air is forced through the heat exchanger tubes by a blower at the rate, governed by an air weight controller, of 800 or more pounds per minute. This amounts to about 11,000 cfm, varying with changes in atmospheric conditions. Temperature of blast air is held between 400 and 500° F, although the system can be adjusted to furnish air from room temperature to 600° F. Pressure of air entering the cupola, recorded at the wind drum, is 24 osi (mercury). An automatic unit just above the heat exchanger tubes blows a jet of air every 5 seconds over the tubes to clean off adhering soot.

Cupola gases leave the top of the combustion unit at 1100° F and travel through ductwork to the bottom of the wet-type dust scrubber. As the dust-laden gas rises through a series of water sprays, solid particles are removed and the resulting slurry is drained from the bottom into a sluice which also catches slag from the front-slagging cupola and flows into a settling basin.

A seal is constructed across the scrubber shell about a third of the distance from the top, and cleaned gases at 150° F are drawn off below this seal through a centrifugal type exhauster. Gases re-enter the shell above the seal and are exhausted to the atmosphere as clean, white water vapor.

This exhaust fan controls flow of gases through the entire system and is governed by a second air weight controller to maintain a negative pressure of 0.1 in. of water in the cupola head.

A central panel containing indicator lights, dials and pushbuttons is used to control the entire system. Various operating units in the system are so



Charging bucket picks up steel cover on its way to top of cupola. Cover stops escape of air contaminants when the charge is emptied

Atop the foundry, the dust collector gives off a clean white water vapor which evaporates readily. Recuperative hot-blast unit is in foreground

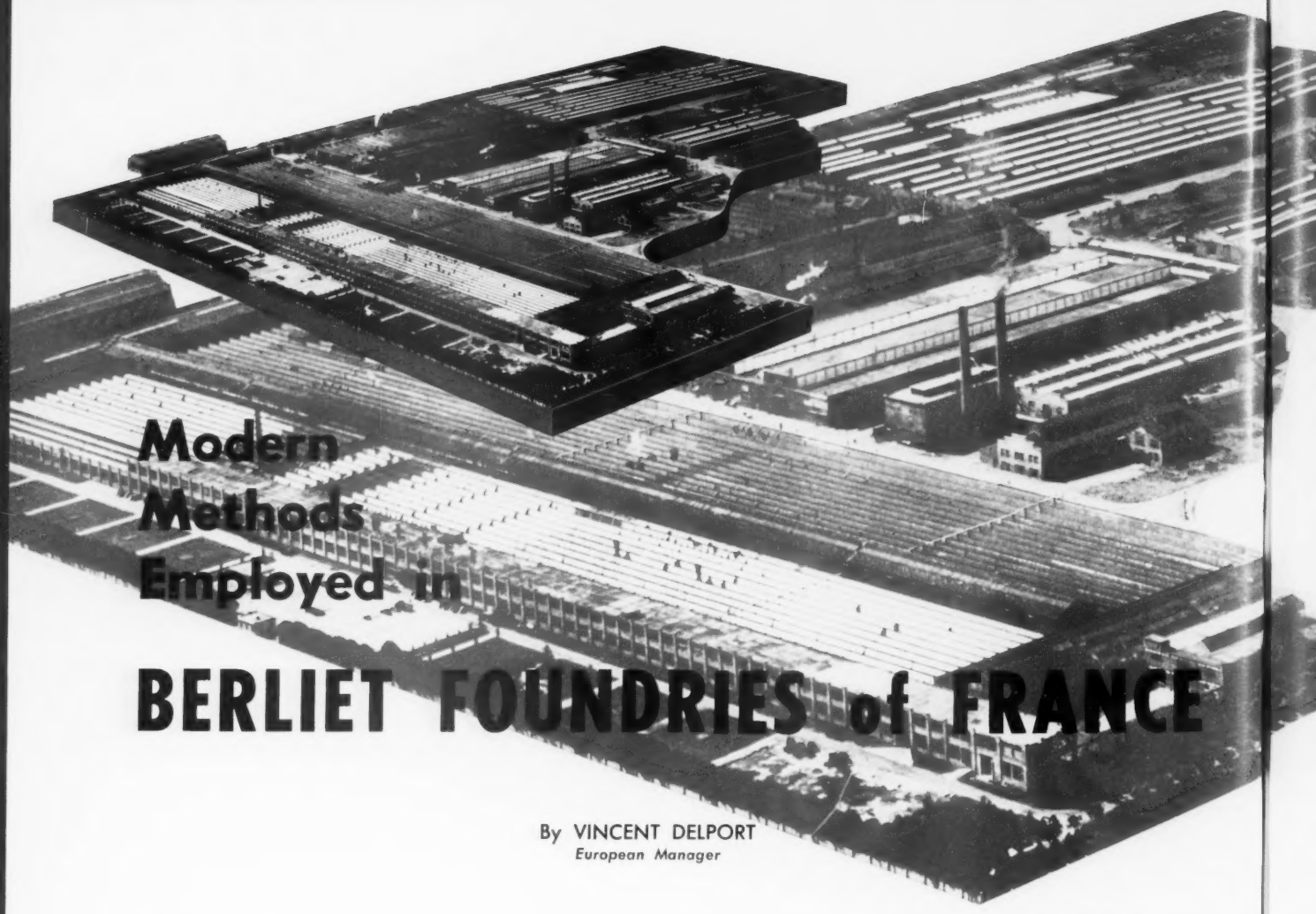
sequenced and synchronized that they must be turned on in the proper order and shut down in reverse order. Once the system has been put into operation by pushbutton switches, its various units function automatically through a series of electric controls, continuously compensating for operating variables.

The control panel also contains a small rectangular opening about 12 in. long and 6 in. high. Eight streams of water from ¼-in. test pipes fall past the opening to indicate proper circulation around the water-cooled dampers and damper frames at the relief stack, pressure control point and at the exhaust flue on each of the two cupolas in the system.

If any one of the units in the system becomes inoperative, the fly ash collector and the combustion unit are cut out of the system by the pressure control damper, and cupola gases go out the relief stack. A horn is sounded to signal operating personnel of the breakdown and to notify the charging equipment operator to stop charging.

Gases also are diverted to the relief stack at the end of a day's operation, for about 45 minutes, after cupola charging has stopped. At that time, when the level of material in the cupola is descending slowly, cupola gases sometimes reach 220-240° F—a temperature too high to be handled by the combustion and scrubber systems. During the close-off the purge dampers are opened to assure removal of all gases.

Modern Equipment Co., Port Washington, Wis., installed the complete system, using one of its cupolas, a recuperative hot blast unit by Kewanee-Ross Corp., Buffalo, and a multiwash collector made by Claude B. Schneible Co., Detroit.



Modern Methods Employed in BERLIET FOUNDRIES of FRANCE

By VINCENT DELPORT
European Manager

THE iron and steel foundries of S.A. Automobiles M. Berliet, at Venissieux, Lyon, France, are notable for the importance of their production, their modern methods, and for the fact that molds for their main castings are built up around heavy core assemblies.

Berliet is a leading European maker of heavy commercial vehicles and produces 53 per cent of the total output of such vehicles in France. The first Berliet automobile was constructed in 1897 in a 1000-sq-ft workshop; today the plants are the largest in southeastern France.

The works are self-contained. They include their own foundries, forge, stamping and machine shops, assembly line and body-building and finishing departments. At present over 10,000 workers are employed, some live 30 miles from the works and travel to and from it in the company's fleet of motor coaches.

The whole works at Venissieux and at Monplaisir occupy nearly 1000 acres, of which 160 are covered (Fig. 1). A testing track at Lyon-Monplaisir is about 1 mile long. The plants are equipped with some 7500 machine tools. Present annual output is approximately 6000 trucks, motorbuses, and tractors; 2000 industrial engines; and 4000 tons of spare parts.

The foundries employ about 1000 workers and have an average monthly output of 1000 tons of iron castings, 500 tons of steel castings and 70 tons of bronze and aluminum castings. An outstanding feature of the organization is that the engines generally are built around a standard cylinder unit of 120-mm bore by 140-mm stroke. These cylinder units are combined to make vertical motors of 4, 5 or 6 cylinders and horizontal motors of 5 or 6 cylinders. The 5-cylinder motors are said to run very smoothly. A number of engines also are built around cylinder units of 110 bore and 130 stroke. This standardization of cylinder units permits operations on a full mass production basis.

The iron and steel foundries occupy a covered space 1085 ft long and 415 ft wide. The iron foundry is 625 ft long.

Iron Melting—In the iron foundry, the melting plant is comprised of four cupolas—two 43.3-in. ID units with a capacity of 7 tons per hour and two 25.6-in. ID units with a capacity of 2 tons per hour. The smaller units have basic lining and are water cooled. They are used for special cast iron for brake drums, cylinder head and nodular iron castings.

For the standard cylinder blocks, composition of the charges in the two larger cupolas is 25 per cent steel scrap from the steel foundry, 55 per cent iron scrap from the iron foundry and 20 per cent pig iron. Charges are made up in trolleys and weighed before being carried by skip hoist to the charging platform. Molten metal is carried to the pouring station in ladles of 500 and 1000-kg capacity by motor trolleys or overhead cranes (Fig. 4.)

An additional supply of iron is obtained by melt-

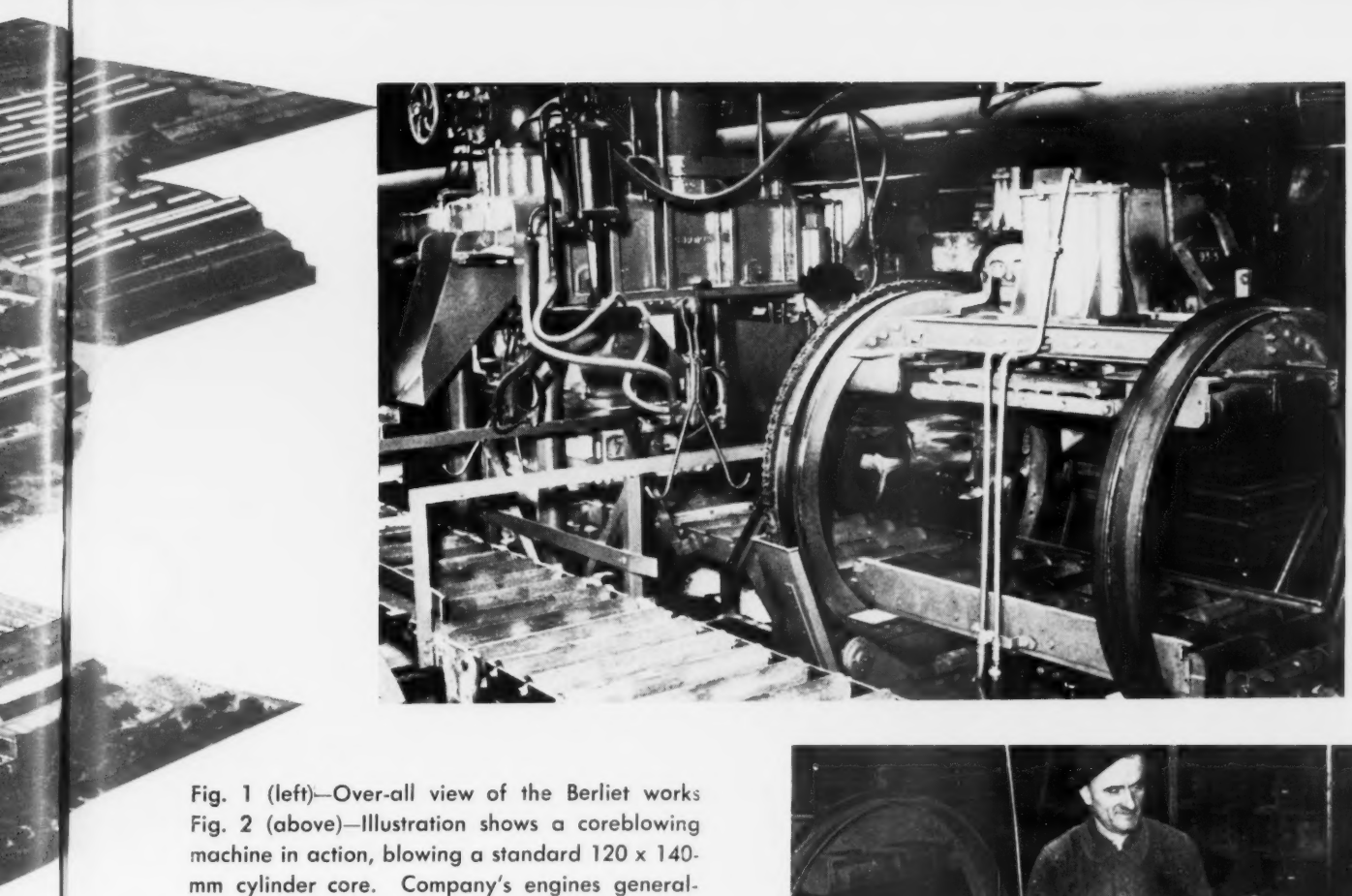


Fig. 1 (left)—Over-all view of the Berliet works
Fig. 2 (above)—Illustration shows a coreblowing machine in action, blowing a standard 120 x 140-mm cylinder core. Company's engines generally are built around standard cylinder of this type.
Fig. 3 (right)—View of one of the finished cores

ing turnings from the machine shop. These are melted in a 1500-kw, Heroult-type electric furnace with automatic hydraulic control of the electrodes. Lining of the furnace is rammed siliceous refractory.

The charge is made up of 90 per cent turnings and 10 per cent new iron in small slabs, automatically weighed and charged by equipment similar to that used for an open hearth steel furnace with revolving spoon. Turnings are stacked and classified according to the castings from which they orginate. To obtain metal of a consistent grade, one-tenth of the original charge, about 400 kg, is tapped, then replaced by a fresh charge of turnings and new iron in the same proportions. Iron from this furnace is used for ordinary machine castings.

Molding Sand Preparation—Used sand is returned from the shakeout stations by underground conveyor and elevator to the aerators and humidifiers and mixed with new sand by two endless screw mixers and five sand mills. The daily turnover of molding sand ranges from 400 to 500 tons. The amount of new sand added daily is from 6 to 10 tons. No facing sand is used. Reconditioning is effected by using the core sand from the molds, to which is added sawdust, bentonite and pitch. Molding sand is carried by overhead belt conveyors to hoppers which feed the molding machines at each molding station.

Coremaking—Cores are the essential part of the

Fig. 4—Tapping cupola. Molten metal is carried to pouring station in ladles of 500 or 1000-kg capacity by motor trolleys or by overhead cranes

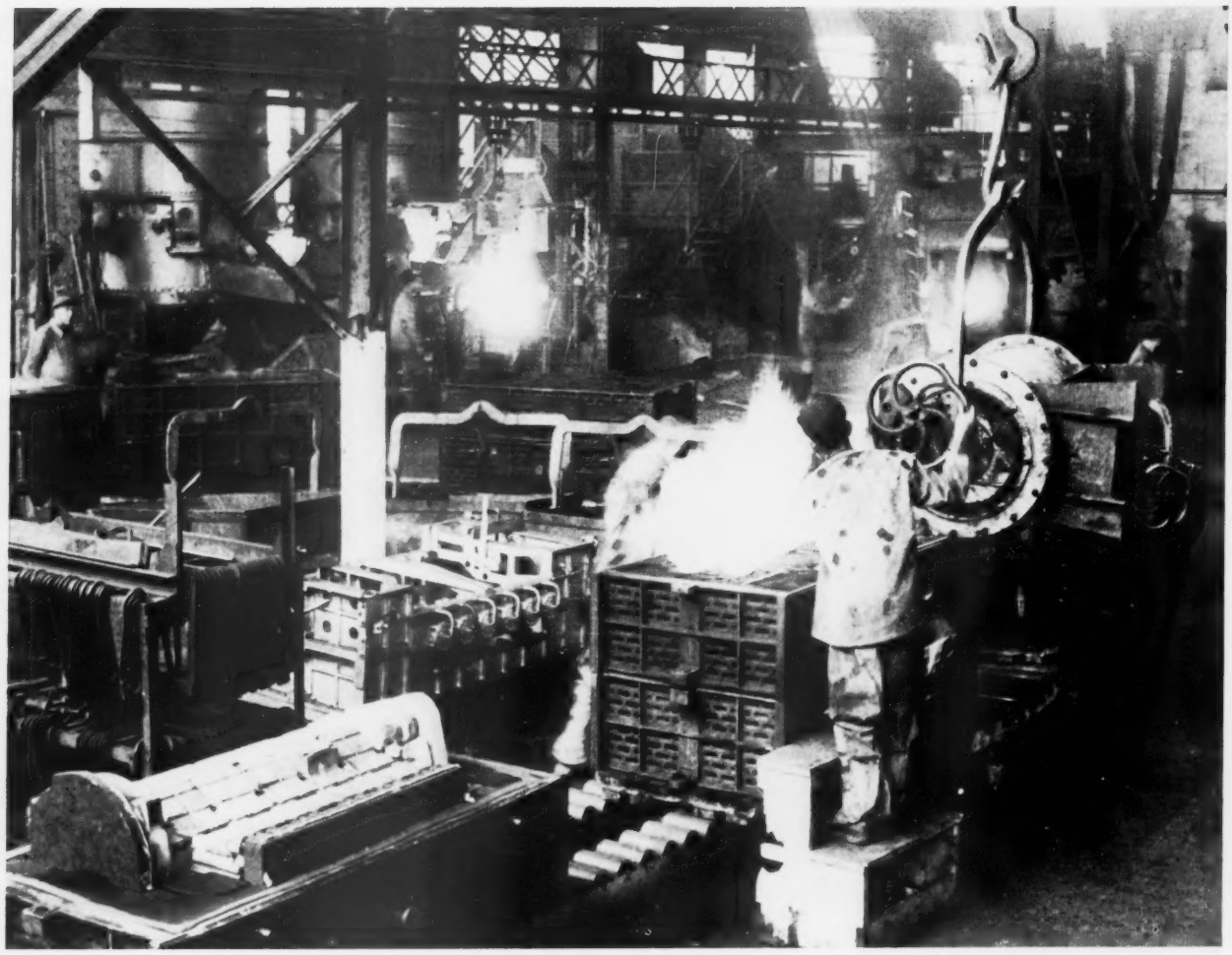


Fig. 5—Crew is shown as it pours one of the cylinder block castings

preparation of the molds, particularly for the standardized cylinder blocks. The main cores, which can weigh as much as 148.7 lb, are made on large coreblowers. A special treatment provides core sand of constant composition and viscosity. Sand is dried in a rotating furnace at the rate of 4 tons an hour, then stocked in silos located above three mullers. Core oil is pumped into containers which are maintained at a constant temperature by controlled hot water circulation. Thus the degree of viscosity and the quantity of core oil pumped into the containers are kept constant. Operation of the mullers is controlled automatically at control panels where all the gages and switches are grouped.

When treated, the core sand is collected in buckets which are carried above the coreblowing machines by a monorail trolley which also carries the operator responsible for feeding the coreblowing machines. Fourteen coreblowing machines are in operation: Ten machines of different sizes for the larger cores, three machines for small cores and one for hand molding of large cores. Fig. 2 shows the machines on which the heaviest cores are blown. Single cores up to 148.7 lb can be blown. The core unit for the standard 120 x 140-mm cylinder weighs 132 lb, and 20 are produced per hour (Fig. 3). Heavy cores are conveyed to the drying ovens by belt and roller conveyors; smaller cores are conveyed by cages on a monorail.

Cores are baked in three ovens heated with fuel oil and by recirculation of the hot gases. Temperature of 225 to 240° C is controlled automatically by a pyrometric couple and a thermostat. Cycles vary with the sizes of the cores: For smaller cores, the heating period is one hour and 50 minutes; for medium-sized cores, 2 hours and 40 minutes; for larger cores, 5 hours and 30 minutes. These times cover from the introduction of the cores in the ovens to their exit.

Tests are being made with synthetic phenolic resins which, if successful, would reduce the heating cycles by 45 per cent. Under present conditions, 35 tons of cores are treated in an 8-hr period. When baked, the cores are conveyed to the molding stations by shelves routed by electric elevating trolleys.

Molding Department—The present layout of the iron foundry includes seven molding lines. Three are parallel to the axis of the foundry and are about 130 ft long; the other four are across the foundry and are approximately 100 ft long. This layout is to be modified to include eight lines, all of them across the foundry and from 80 to 100 ft long. Flasks and molds are moved on roller con-

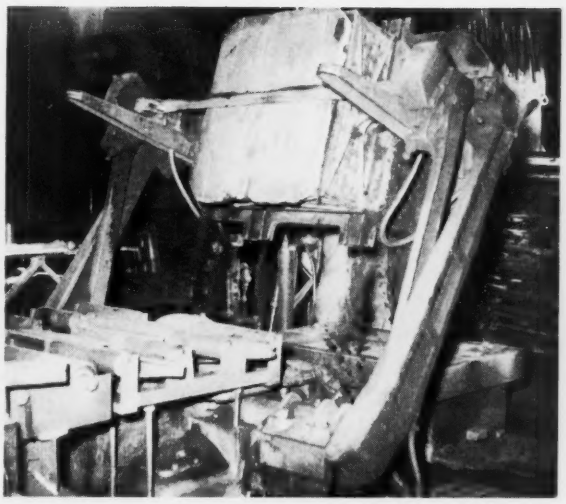


Fig. 6—Molding equipment includes 23 molding machines. All of them are jolt machines, and nine are rollover units

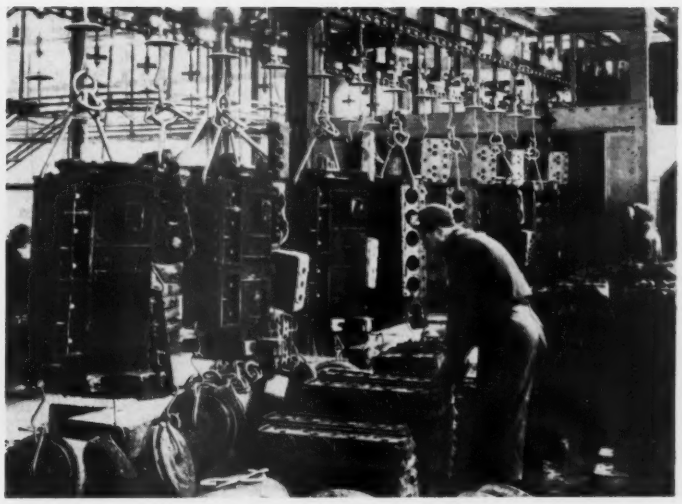


Fig. 7—Fifty-four tons of castings are treated daily in the cleaning department. Here, heavy castings are entering tunnel for blast cleaning

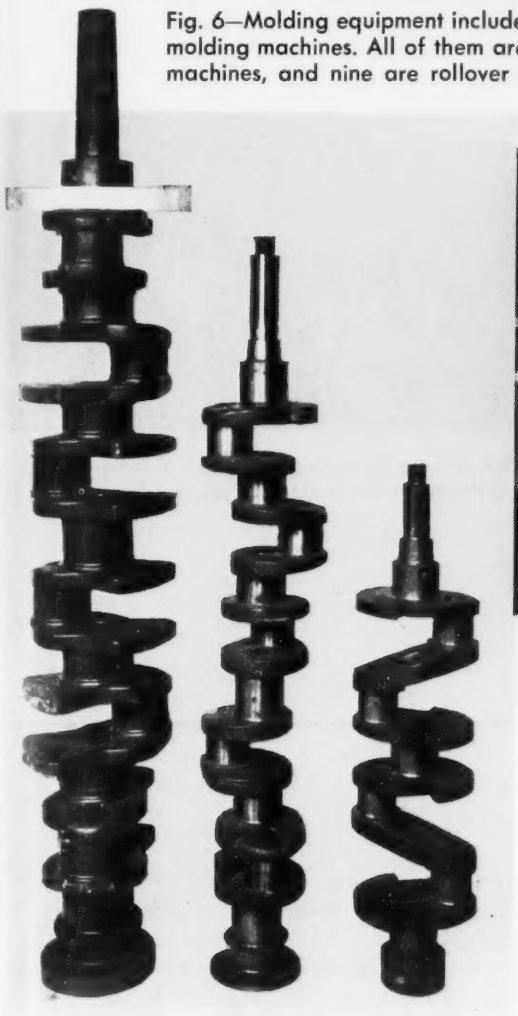


Fig. 8 (above)—A view of the molding line in the steel foundry

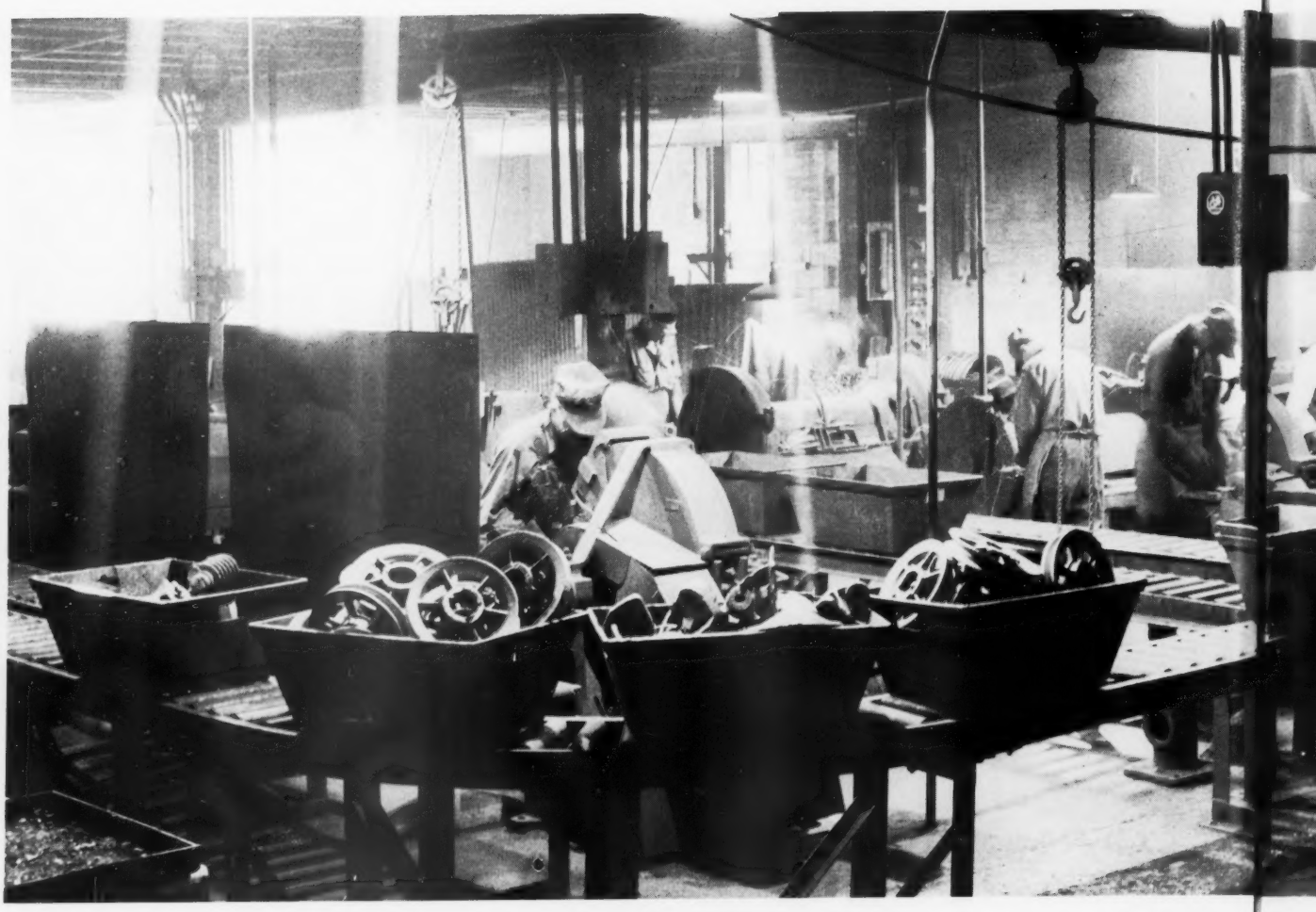
Fig. 9 (left)—Three prototype cast nodular iron crankshafts made experimentally for use in diesel engines used in company's trucks

veyors. Each line has two motive sets of rolls, one where the drag comes out of the molding machines, the other just in front of the shakeouts.

Molding equipment includes 23 molding machines. All 23 are jolt machines, and nine are rollover units (Fig. 6). The largest flasks are 5 ft 3 in. long, 2 ft 9 in. wide and about 18 in. high. A complete mold, cope and drag for a large cylinder block weighs 3300 lb. These blocks are molded at the rate of six per hour. Certain molds are painted with an alcohol varnish and graphite and surface-dried with a blowpipe before being closed.

The important operation of coring up and closing the molds for the cylinder blocks is done by a method which the active manager of the foundry, R. Baumes, observed during a 1947 visit to the Packard foundries in the United States. Cores are assembled in a metal frame and positioned accurately by templates. An intermediate flask is fastened to the frame with accurate pins, and the whole assembly, comprising the cores for the cylinder block, is lifted by pneumatic hoist and placed in the drag. The cope then is placed on top and the mold securely closed.

Molds are poured from ladles carried by an electric traveling crane. No pouring is done by hand. A mechanical (*Please turn to page* 242)



General view of the cleaning room for small size castings. Boxes of castings move to all sections of the department on the roller conveyor system

Straight Line Flow Ends

CLEANING ROOM BOTTLENECK

By ROBERT H. HERRMANN
Associate Editor

Turntable switches in the convenient, work-height conveyor guide totebox loads of castings to various work stations in the system

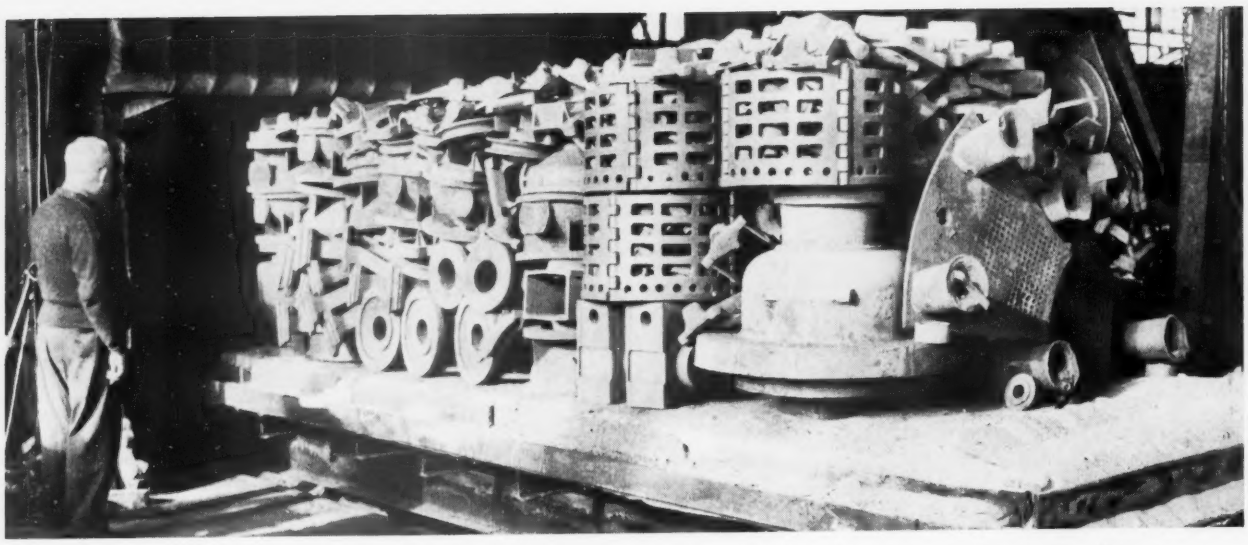
Special grinding machine is used for medium size castings too large for stand or bench grinders

IN MANY foundries the cleaning room is a bottleneck to expanded production. But at Empire Steel Castings Inc., Reading, Pa., that bottleneck has been busted wide open by a recently completed foundry modernization program. Waist-high roller conveyors form a network of material-carrying arteries along which castings are pushed to the various machines in the step-by-step processing of gate removal, grinding, chipping and welding.

Streamlining the cleaning operation has saved 27 per cent of cleaning costs in the handling of castings weighing 50 lb or less. These comprise a majority of the work produced at Empire.

Castings are brought into this section from shakeout in dump type tote boxes carried by electric platform lift trucks. Boxes are set on the floor in front of a centrifugal blast tumbling machine charged by skip hoist and their loads dumped into

Risers are burned off stainless steel castings with an oxyacetylene, iron powder cutting torch



Carbon steel castings are normalized in this car type oven. Smaller ovens are used for heat treating stainless steel and the special alloy castings

the skip bucket. A jib-crane-mounted electric hoist is used to lift out extra heavy castings.

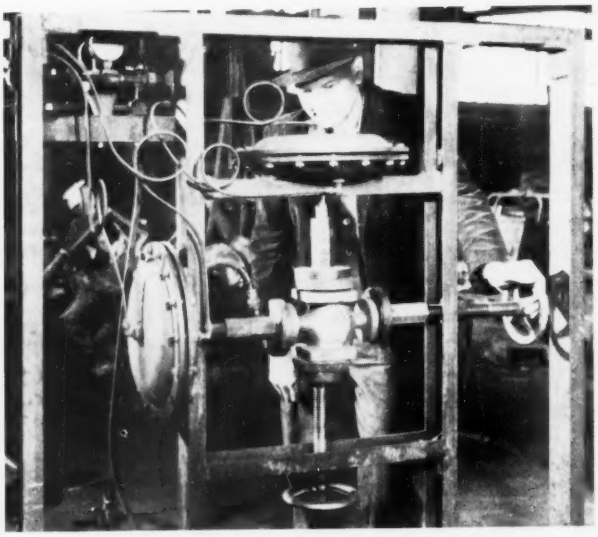
Following tumbling and blasting with malleable iron shot, castings are discharged to self-dumping tote boxes which are carried by platform lift truck to one of two abrasive wheel cut-off machines or to a rectangular section of the roller conveyor system. Within this rectangle are oxyacetylene torches for removal of gates from carbon and low-alloy steel castings. Gates are removed from stainless castings by iron powder cutting torch in another section of the room.

As castings are picked from the hoppers and the gates removed by either cut-off wheels or torches, they are tossed into 18 x 30-in. boxes on the roller conveyor. Filled boxes are pushed into a canvas-curtained booth where gate stubs are washed off with an electric arc-compressed air torch. From the booth the boxes can be diverted from the main conveyor through switches to conveyors alongside grinding machines.

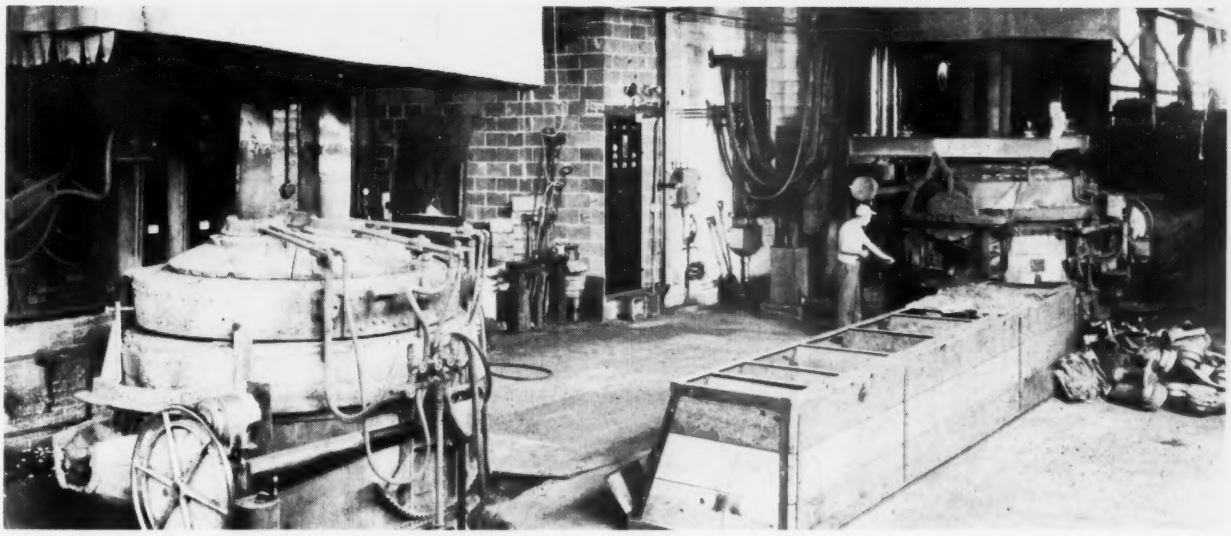
Two of the grinders in this section are unique tools developed by Empire engineers. Each consists of a two-wheeled dolly containing an electric motor which drives a grinding wheel at the end of a shaft about 3 or 4 ft long. The dolly rides on a low, wooden bench covered with steel plate. Along one end of the bench is a line of holes which hold a moveable metal wedge plate. Castings are held in place for grinding between that wedge and an air-cylinder-operated clamp. By grasping two handles mounted on a framework at the grinding wheel end of the shaft, the operator can roll the dolly to and fro on the bench, applying the grinding wheel to any part of the casting's top surface.

Other grinding equipment consists of standard single and double-end constant speed floor stand and bench machines.

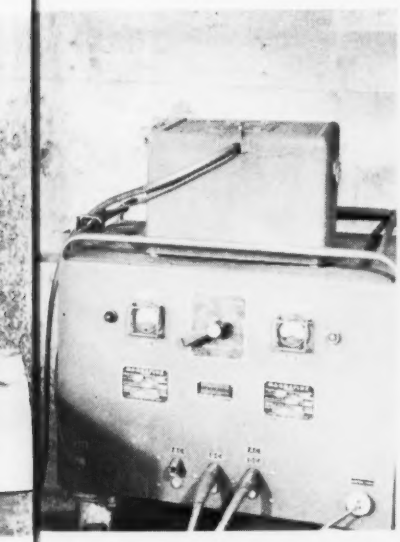
Tote boxes are pushed from the grinding station conveyors to a roller-topped transfer car which is



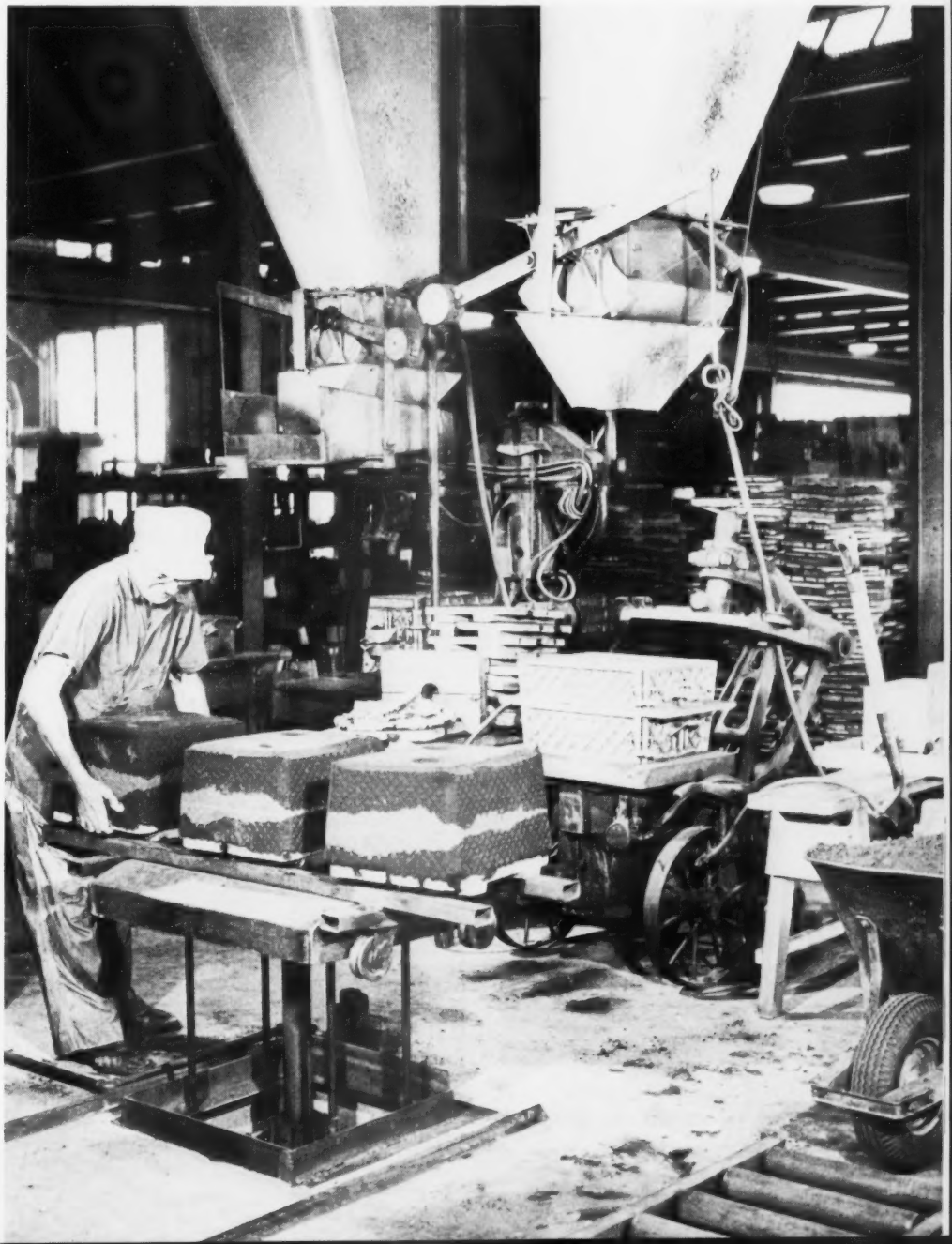
All valves and other pressure castings are tested under pressure in equipment similar to that above



Stainless steel is melted in a 1½-ton per hr side-charge furnace shown at left. The 2-ton top-charge unit, right, melts carbon and low alloy steels

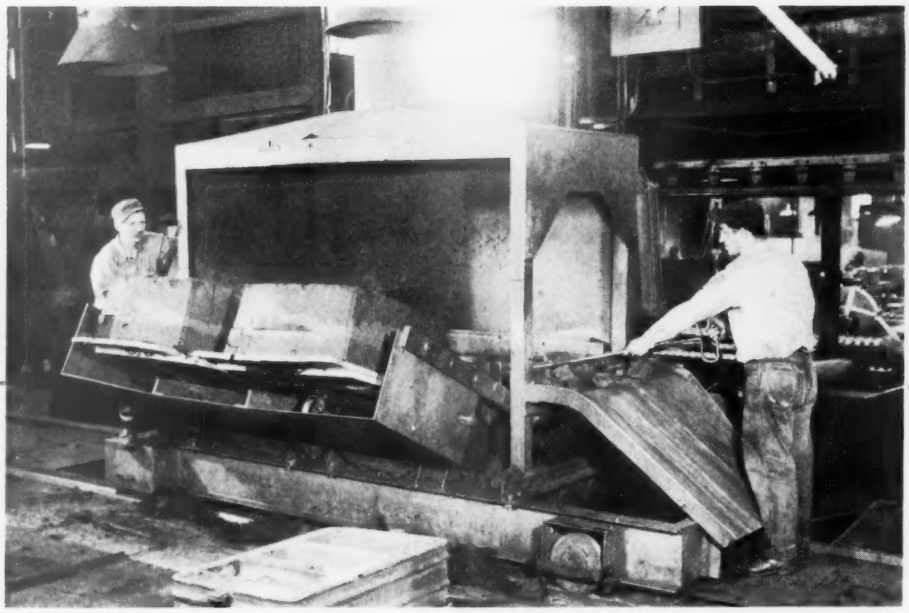


Castings inspection includes Magnafluxing on a sampling basis. Being checked here is a high pressure valve casting



Pneumatic device raises dollies to work height to receive molds. When lowered to track, mold-carrying dollies are rolled to pouring area

Molds are poured on these dollies, having grooved wheels which ride on an angle iron track. Note roller conveyor for returning bottom boards and dollies to molding machines



Molds are dumped to a mobile shakeout. Dust collector has overhead openings at the end of each mold-carrying line

Overhead hoppers feed sand to large floor work jolt machines

Well lighted coreroom is equipped with a core blower, several benches and a new core oven to produce a large number of cores

This is a general view of the pattern shop used primarily for the mounting, heading, gating and repair of wood and metal patterns

pushed along rails on the floor. Rollers on the car can be aligned with any of five conveyors which traverse the chipping section and boxes of ground castings rolled to the chippers. Operators pick castings from the loaded boxes, perform chipping operations on wooden benches along the conveyor and throw chipped castings into waiting empty boxes.

At the ends of these conveyors the filled boxes are pushed onto a second transfer car which may be aligned with any of three roller conveyors, passing through three sheet metal booths for electric welding and arc-air washing. Beyond the booths are a number of benches where final chipping and grinding are performed with portable pneumatic tools.

Castings weighing 50 to 100 lb are cleaned in an area down the center of the building separated from the small casting cleaning section by an aisle. Two roller conveyors flank this section. Between these conveyors at the head end is a swing grinder and a stationary grinder, followed by benches where pneumatic grinding and chipping operations are performed.

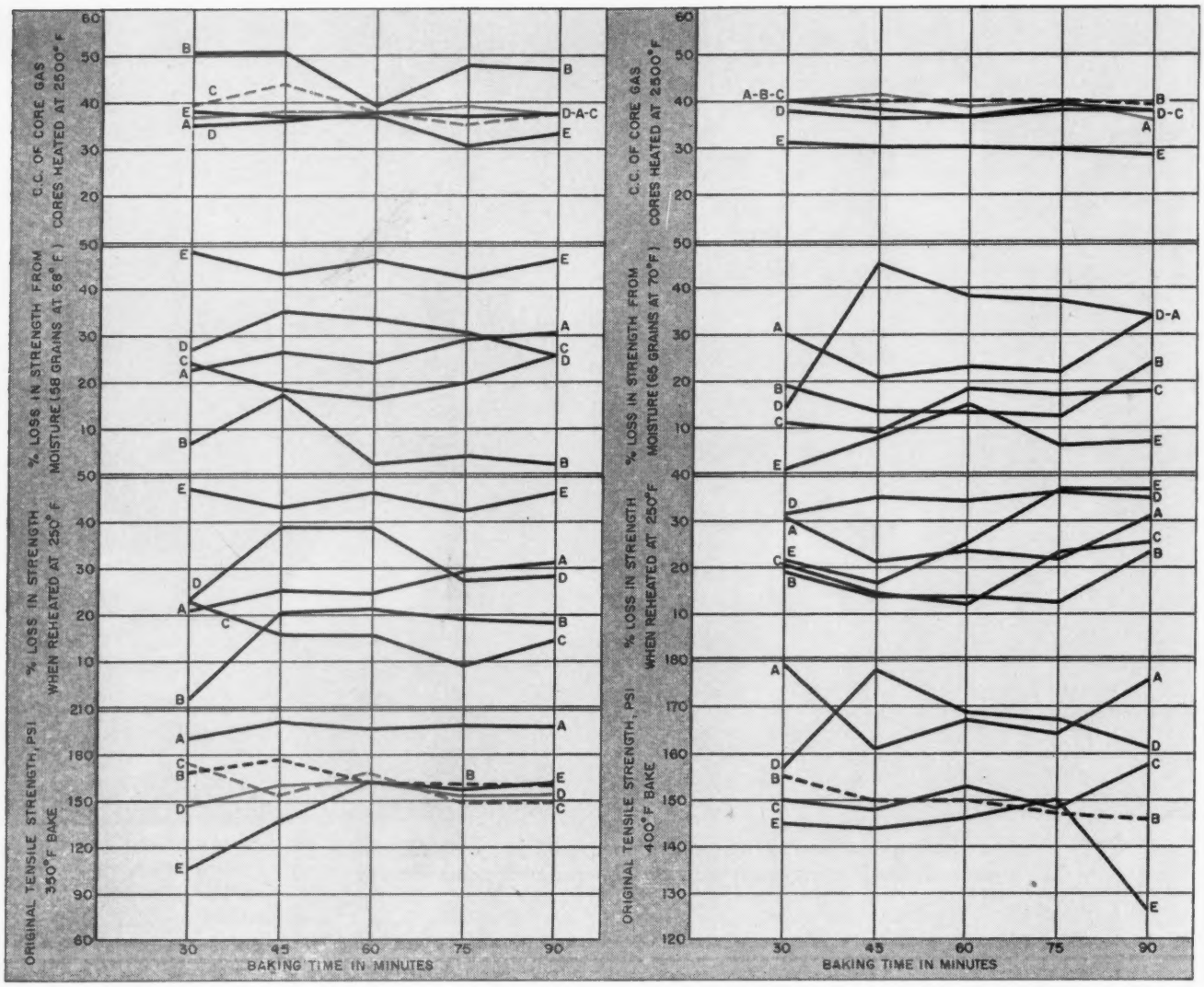
An overhead monorail bridge crane system with 1-ton electric hoists spans this section and the small casting cleaning area for handling some of the heavier castings.

Third section of the cleaning room handles castings weighing more than 100 lb; the largest ever cast at Empire is 1 ton. This area is adjacent to the medium castings section along the building wall opposite the small castings section.

A centrifugal blast, skip-hoist charged, tumbling machine, a walk-in shot blast unit for large castings and special work, plus two welding booths divide the large and medium casting cleaning areas and service both. An iron powder cutting torch is used adjacent to one of these welding booths for cutting gating systems from all stainless steel castings.

Following blast cleaning, castings are ground on either of two swing grinders. They then are loaded onto a push car which operates on floor rails between two rows of wooden benches, five in each row. Here, pneumatic chipping operations are performed. Two jib cranes are available over these benches for handling castings between benches and car. A bridge crane services the entire large bay cleaning area. Castings not requiring chipping or welding by-pass these operations on a gravity roller conveyor.

Carbon steel castings from all the cleaning room sections then are normalized in oil-fired car-type ovens of 6 to 8 tons capacity. Treatment is based on 1 hr per in. (*Please turn to page* 220)


ORIGINAL TENSILE STRENGTH, PSI
350°F BAKE
% LOSS IN STRENGTH WHEN REHEATED AT 250° F
% LOSS IN STRENGTH FROM C.C. OF CORE GAS MOISTURE (58 GRAINS AT 68° F.) CORES HEATED AT 2500° F
BAKING TIME IN MINUTES
ORIGINAL TENSILE STRENGTH, PSI
400°F BAKE
% LOSS IN STRENGTH WHEN REHEATED AT 250°F
% LOSS IN STRENGTH FROM C.C. OF CORE GAS MOISTURE (65 GRAINS AT 70°F.) CORES HEATED AT 2500°F
BAKING TIME IN MINUTES

Figs. 1, 2 and 3 (left to right)—Charts show results of four tests used in study of cores baked with five different phenolic resin binders at 350, 400 and 450°F

Some Properties of

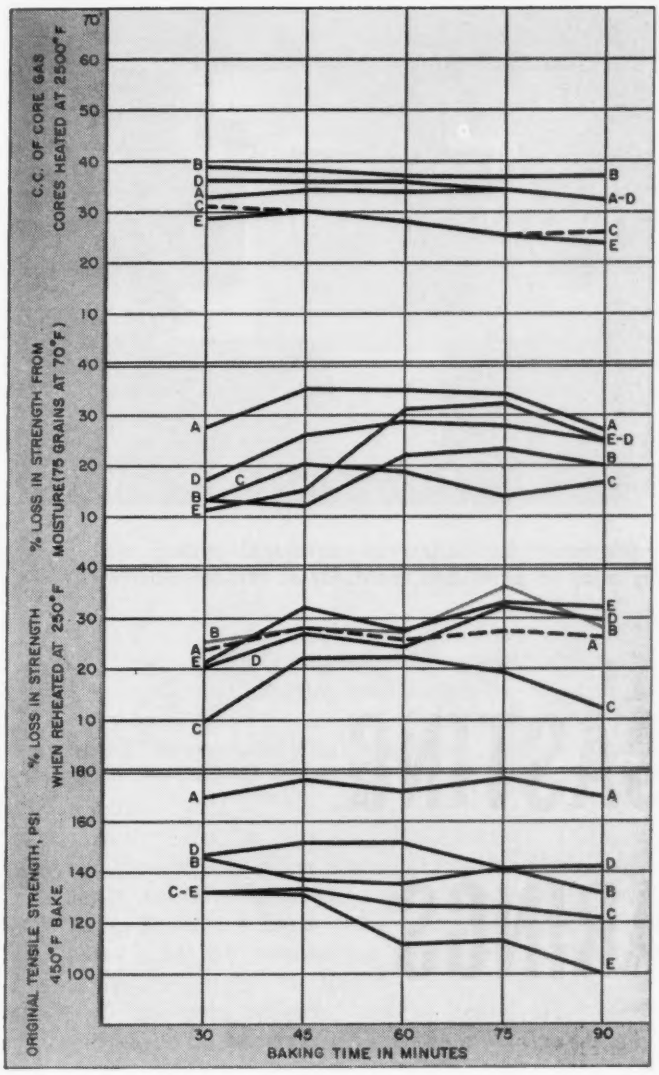
Phenolic Resin Core Binders

The author made four types of tests on cores made with phenolic resin binders and baked for various lengths of time at temperatures of 350, 400 and 450°F. This article presents the results of his experiments

By CARL E. SCHUBERT
Associate Professor of Mechanical Engineering
University of Illinois
Urbana, Ill.

DURING the past few years much discussion of the use of thermosetting binders in shell molding and in dry sand cores has appeared in foundry literature. It is the purpose of this work to present data collected on some physical properties of dry sand cores made with thermosetting binders. Several commercial phenolic binders were used in the study. No attempt was made to cast metal around the cores.

All of the tests were made, insofar as possible, according to AFS procedure and recommendations. A conventional, thermostatically controlled, cross-flow electric oven was used to bake the cores. This was done so that some idea of the physical properties of dry sand cores could be determined for foundries without dielectric core ovens.


ORIGINAL TENSILE STRENGTH, PSI 450°F BAKE
% LOSS IN STRENGTH WHEN REHEATED AT 250°F
% LOSS IN STRENGTH FROM MOISTURE(75 GRAINS AT 70°F)
C.C. OF CORE GAS CORES HEATED AT 2500°F
BAKING TIME IN MINUTES
30
45
60
75
90

The universal strength testing apparatus was calibrated for compressive strength by using a proving ring. Therefore, it safely could be assumed to be correct in tension since both tests are performed by using the same pendulum and fulcrum.

Four tests used in the study were chosen because it was felt that they give the foundryman information that he is anxious to have. They were as follows:

1. Tensile strength of cores baked at various lengths of time and temperatures, known in this study as original tensile strength of cores.
2. Per cent loss in strength of cores reheated at 250°F after previous baking and cooling in a desiccator.
3. Per cent loss in strength of cores due to moisture absorption.
4. Total amount of core gas given off at 2500°F.

Five commercial phenolic resin samples were labeled in this study as binders A, B, C, D, and E.

All cores made were prepared from the same washed and dried 65-mesh silica sand, and one core sand mixture was used throughout the tests. After each sand mixture had been prepared, enough test cores were rammed up on aluminum core plates and immediately placed in the previously heated oven. Temperatures were held constant for the cores that were baked at 350°F; ±2°F for those baked at 400°F; and ±4°F for those baked at 450°F. This was done by using various resistances instead of the thermostatic controls.

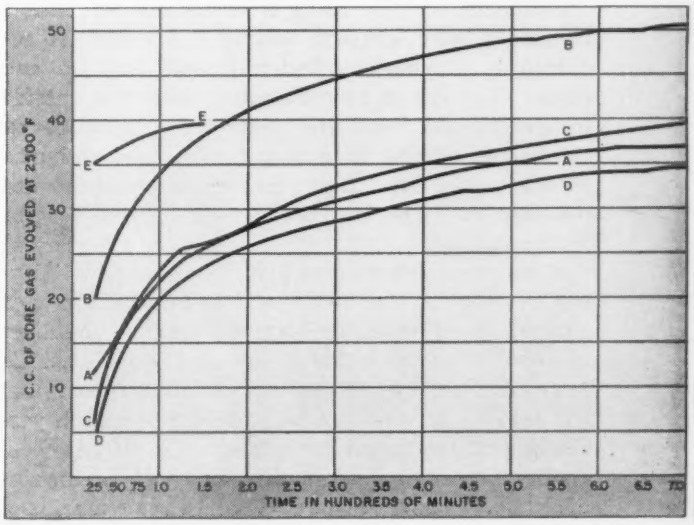
As soon as the baking cycle was completed for each set of cores, they were removed from the oven and allowed to cool in the air for five minutes before being removed from the core plates. Upon removal they immediately were placed in a desiccator and allowed to cool to room temperature. This method prevented the moisture in the atmosphere from attacking the core binder. All cores were left in desiccators until ready for testing.

Baking cycles of 30, 45, 60, 75, and 90 minutes were used in the work. Temperatures of 350, 400, and 450°F were used to determine the effect of these variables on the strengths of the cores. It was felt that many foundrymen desire this information because it helps them to decide what temperature to use in their particular foundry ovens. It also gives them added information as to the binder's ability to withstand overheating without undue loss in strength.

Two cores were used to determine the strength of cores at 250°F for each baking time. Two cores were used to determine the percentage loss in strength due to the effect of moisture. Also, one core was used from the original tensile strength test to determine the amount of core gas at 2500°F. In this way, extra core gas due to moisture pickup was avoided because the core gas determination was made immediately after the original strength tests had been performed.

The sample for the core gas determination was prepared by using one-half of the broken tensile specimen for a sample. A file was used to gather a sample on paper. The loose grains were then weighed accurately to 3 grams and placed in an alundum boat. (*Please turn to page* 248)

Fig. 4—Results of tests to determine rates at which the binders gave off their gas at 2500°F



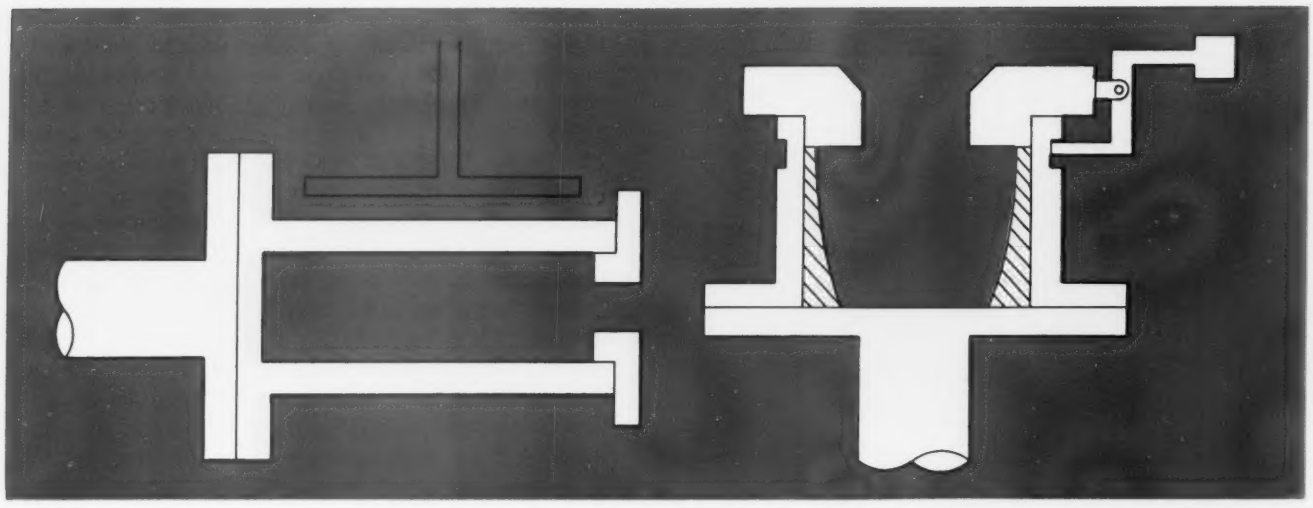


Fig. 1 (left)—Fundamental requirements for horizontal centrifugal casting machine. Fig. 2 (right)—Rotating adapter plate and mold for a vertical machine

CENTRIFUGAL CASTING OF SLEEVE BEARINGS

By J. B. MOHLER
Consultant
New Castle, Pa.

MANY sleeve bearings are centrifugally cast simply because of the economy of the process. The economy results from the fact that an entire order can be run on a single mold or a single set of adapter plates. An order for 50 to 5000 bearings in size ranges from 1 to 15 inches in diameter is often run by this process.

Simplicity of the mold is a distinct advantage compared with gravity casting. All that is required is a simple cylindrical mold and an end plate. The use of forced cooling from the outside in conjunction with the centrifugal pressure on the metal results in a sound structure and also speeds production. Light impurities and dross are included with the last portion of the metal to be frozen.

Since the inside freezes last, it feeds the solidifying portion of the metal and takes the place of gates and risers in gravity castings. Should an unsound layer of metal freeze at the inside, it is later removed with a relatively small tool cut, and the amount of sound metal obtained is a high percentage of the metal poured.

The method is limited to cylindrical parts, single flange parts or parts that can be machined economically from a cylinder. These shapes are commonly used for the manufacture of sleeve bearings.

The method is also limited to those alloys that will not segregate under the influence of the centrifugal action of the metal poured.

Copper-base alloys are cast in permanent steel or cast iron molds by conventional centrifugal casting methods.[1] However, the alloys are limited to those containing a maximum of approximately 10 per cent lead, since segregation is severe for the high-lead alloys.[2] Also, trouble has been reported with holes in the ID of centrifugally cast 80-10-10 alloy.[3] Nevertheless, many centrifugal castings of the bronze bearing alloys have been made by this method.

While each foundry has its own set of conditions for casting, general agreement will be found on the fundamental principles. It will be agreed that the mold must be coated with a wash, that the mold must be preheated, that the metal must be sufficiently hot to flow readily into the mold, that pouring must be fast and that the mold speed should be fast enough to produce a smooth casting, but slow enough to prevent segregation.

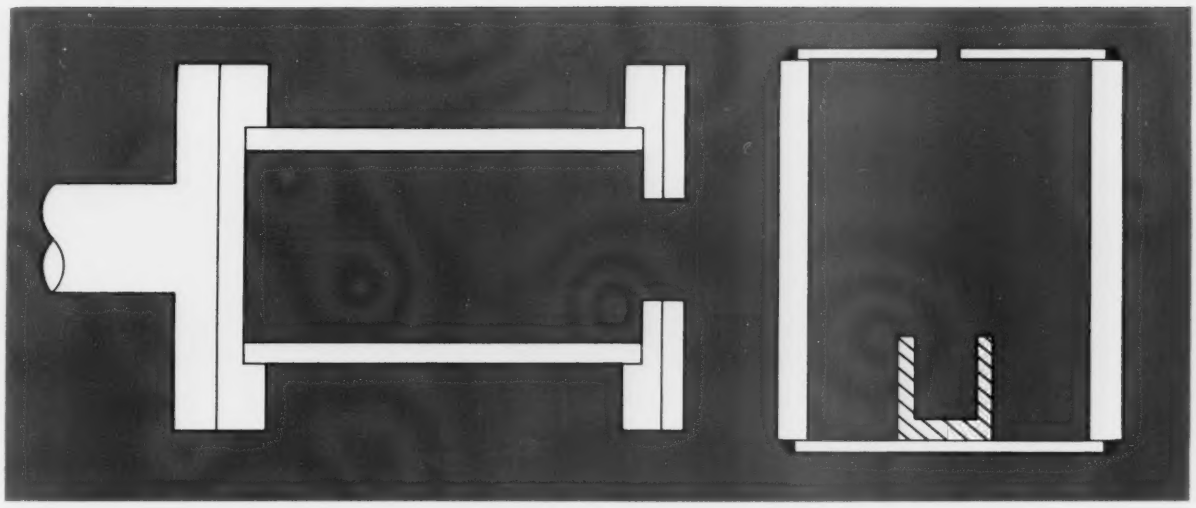


Fig. 3 (left)—Requirements for a bimetallic casting machine. Fig. 4 (right)—When bronze is cast on steel, steel can be protected from oxidation in this way

The mold should be reasonably smooth and clean. For small castings the mold should be tapered for easy removal of the casting, but for castings of 8 in. or larger OD a straight mold may be used, since the casting will shrink enough to be removed readily.

Preference for a mold wash varies. Different combinations of silica flour, bentonite and diatamaceous earth suspended in water have been used. Some foundries have been successful with a thin mold wash, whereas others recommend building up a relatively heavy coating.

It has been reasoned that a heavy mold wash will cover up imperfections in the mold and will act as an insulating layer so that the metal temperature will tend to become uniform before freezing starts. Also, it has been claimed that the proper type of heavy mold wash will crumble during freezing of the bar and that this will facilitate removal. Whether or not this is true, a thin mold wash has been used successfully.

The metal temperature will be about the same as for other permanent mold casting, about 1900 to 2200° F. The temperature required will vary, of course, with the size of the casting, the heat capacity of the mold and the thickness of the mold wash.

The mold may be preheated from 200 to 800° F, again depending on size and heat capacity variables.

Pouring should be faster than for sand castings, to fill out the mold rapidly. To take full advantage of directional freezing from the outside, it is necessary to pour rapidly in order to avoid partial freezing before the mold is full. The metal should be completely molten while in the mold for a short period so that the pressure on the liquid metal created by the centrifugal force may be effective. This is sometimes referred to as "dry-spin." In some cases the quench is withheld for several seconds to assure an adequate dry-spin time, although this is not general practice.

Immediately after pouring, the mold is sprayed with water to freeze the metal quickly. The water is allowed to run until the mold is cool enough to extract the casting or to push the casting out with a hydraulic cylinder.

Edens[1] states that common practice for centrifugal casting of bronze alloys favors this formula:

$G = 0.0000142\ n^2d$, where d is ID in inches, n is rpm and G is centrifugal force in pounds per pound. G will vary from 50 to 100.

Using this formula and an average G of 75 the speeds for various casting sizes are shown in the accompanying table. These speeds are in the

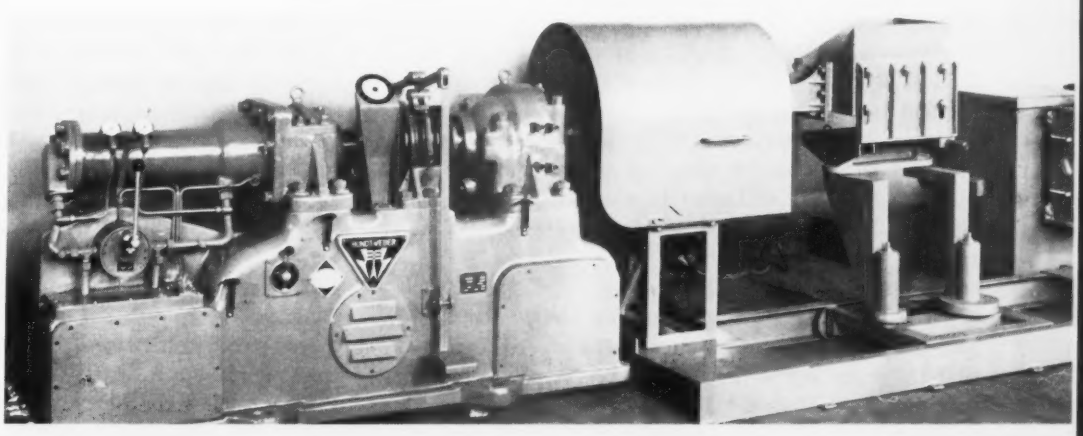


Fig. 5 — Centrifugal casting unit shows, left to right, hydraulic pushout cylinder, tachometer, brake, casting station, pouring station, speed control. Photograph by courtesy of Ryke's Technical Trading Co.

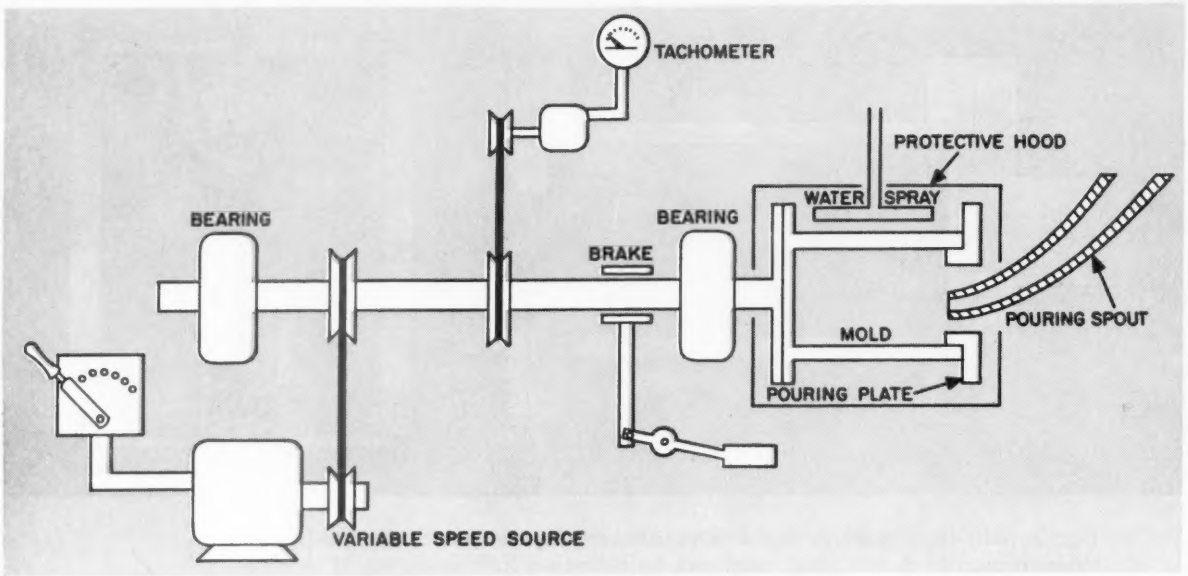


Fig. 6—Schematic diagram of centrifugal casting machine shows components

right range but may be varied for changing conditions. A good general rule for speed is to cast as slow as possible and still obtain a good casting.

Fig. 1 shows the fundamental requirements for a horizontal centrifugal casting machine. The mold is bolted to a rotating adapter plate. Means must be provided for a pouring plate that can be removed readily, such as by means of a bayonet lock. A water spray is located above the mold to spray essentially the full length. The machine should be provided with variable speed and a brake. Naturally it should be well balanced for safety purposes.

Casting may also be done with a vertical mold or with the mold at any angle from 0 to 90°. The advantage of the vertical machine is that it is possible to pour directly into the mold, whereas with the horizontal machine it is generally necessary to provide a pouring spout. The rotating adapter plate and mold for a vertical machine are shown in Fig. 2. The pouring plate can be held on with flying weights, as shown. If vertical casting is used, it is generally restricted to castings where the length does not exceed the diameter. The casting will be parabolic in shape, but with speeds 50 per cent higher than for horizontal castings the thickness at the bottom of the casting will not be excessive.

Bimetallic Castings — Many bimetallic castings are made consisting of a cast lining bonded to a metal backing. The lining may consist of babbitt or bronze. Babbitt may be bonded to steel, cast iron or bronze by this method and bronze may be bonded to steel.

Hack[4] has described the basic requirements for bonding of tin alloys to steel to produce bearing stock. A steel cylinder is cleaned, pickled and tinned. It then is placed between heated end plates, rotated and the babbitt poured. The part is quenched with water spray.

He gives pouring temperatures of 690 to 915° F for tin-base bearing alloys and a speed range of 650-750 rpm for a 4-in. diameter.

This can be used as a reference point for the formula: K = nd, where K is 1400, n is rpm and d is ID in inches.

Centrifugal Casting Speeds

ID of Casting, in.	Bronze Alloys, rpm	Babbitt Alloys, rpm
2	1630	990
4	1150	700
6	940	570
8	810	490
10	730	440
12	660	400

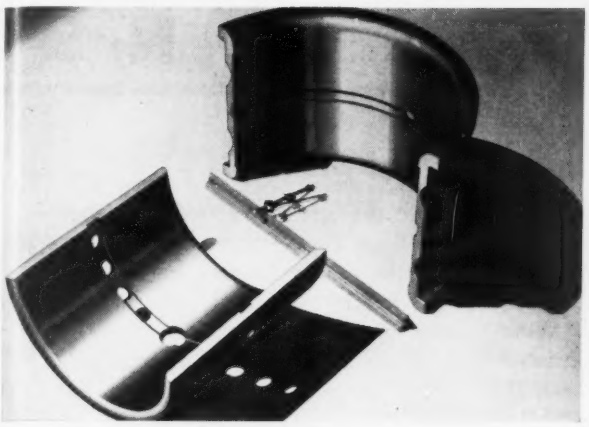
The speeds for various casting sizes are shown in the accompanying table. These speeds are in a range to produce smooth castings and still avoid segregation. The speeds for casting the babbitts are considerably lower than for casting the bronzes, showing that the white metals can be cast with a lower pressure head or at a lower G value.

The requirements for a bimetallic casting machine are shown in Fig. 3. The machine consists of a driven rotating adapter plate and an adapter plate on the other end that is free to rotate. Pouring may be either through one of the end plates or by means of a pouring spout. One of the end plates is actuated by an air cylinder for easy insertion and removal of the shell. Pouring temperatures are in the range given by Hack and tinning temperatures are about 200° F lower. The best temperatures to use will be governed by the size of the shell and the amount of metal poured.

The bimetallic casting process is essentially the same as the permanent mold process, except that the shell must be above the liquidus temperature of the metal cast, just after casting, in order to obtain a bond between the shell and the cast lining. The bond is tested by means of a chisel test and is judged good if the metal cannot be readily broken away from the lining.

The process is the same for casting of babbitt to steel or to bronze. In each case the shell is fluxed and tinned just prior to insertion in the casting machine.

The shell may be tinned with pure tin or with



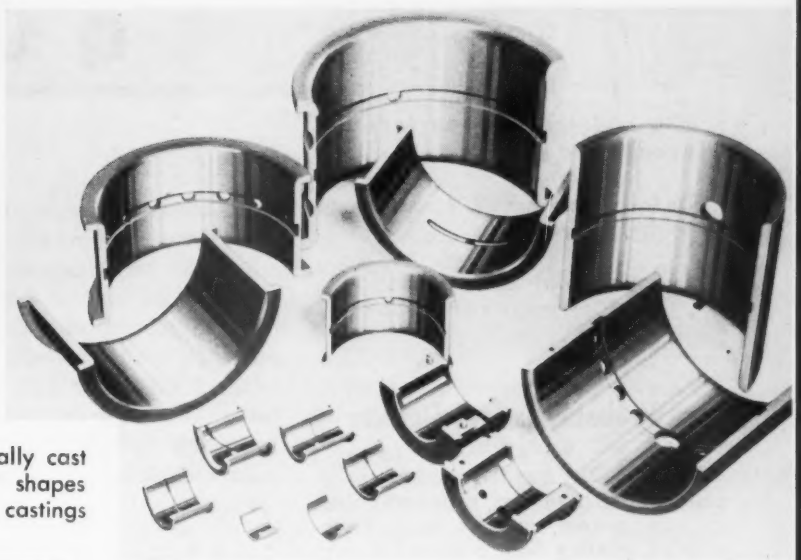


Fig. 7 (left)—Large bronze engine bearings with centrifugally cast babbitt lining. Fig. 8 (right)—Illustrating a variety of shapes and sizes which can be made either as solid or bimetallic castings

Photos of sleeve bearings courtesy Johnson Bronze Co.

Fig. 9—Simple cylindrical bronze bushing was cast centrifugally

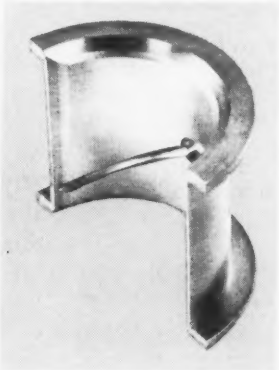


Fig. 10—Bronze-backed, babbitt-lined product of the bimetallic process

lead-tin containing as little as 5 per cent tin. If lead-base babbitt is cast, lead-tin is more economical than tin. If tin-base babbitt is cast, pure tin is used to avoid build-up of lead in the tin-base alloy.

For casting babbitt to cast iron a special chemical cleaning procedure is used[5] to remove the graphite from the surface of the cast iron. This consists of a fused salt process in which the shell is electrolytically oxidized. The shell is then immersed in a reducing bath, dipped in hydrochloric acid, fluxed and tinned. After this treatment the shell may be bonded by the same procedure used for steel or bronze.

Casting of bimetallic bronze on steel is considerably more difficult than casting of the babbitts due to the fact that the steel must be protected from oxidation during the preheating and casting process. Fig. 4 shows a method of overcoming this difficulty. End plates are welded on the steel shell, a carbon cup containing the bronze alloy is fastened inside and a breather hole is bored in one end. This assembly may be preheated to casting temperature, placed in a spinning machine and quenched. The carbon cup will react with any air in the shell to form a protective carbon monoxide atmosphere.

Segregation—This is a problem in centrifugal casting. The centrifugal force increases the rate of segregation many times as compared with gravity casting. The amount of segregation will depend on the alloy, the centrifugal force applied and the length of time the alloy is molten. For alloys such as the tin-base babbitts a small amount of segregation will take place but it can be held within the limits of the alloy specification.

The lead-base babbitts that are high in antimony and tin are very difficult to control, although there is no trouble with the popular SAE 13 lead-base babbitt containing 5 per cent tin and 10 per cent antimony. The popular bronze bushing alloys, such as SAE 64 containing 10 per cent tin and 10 per cent lead and SAE 660 containing 7 per cent tin, 7 per cent lead and 3 per cent zinc, can be centrifugally cast with very little difficulty. Leaded bronzes containing 15 per cent or more lead are considered very difficult, although Esarey[6] gives a composition of 18 to 22 per cent lead and 5 to 7 per cent tin for a centrifugally cast bearing bronze with a good record of service in diesel engines.

Conclusions—The centrifugal casting process is economical for relatively small production runs. However, there must be enough pieces cast to pay for the cost of the mold or the adapters.

The process has been used for many years for a wide range of alloys and bi-metallic combinations.

The general requirements for casting are known, although specific recommendations are not practical due to changes in conditions necessary to compensate for the mold size and the amount of metal poured.

References

1. W. W. Edens, *Metals Handbook*, 1948 edition, p. 852, American Society for Metals.
2. A. Blankenfeld, z. *Metallkunde*, Vol. 31 (1939) pp. 31-45.
3. H. J. Roast, *Cast Bronze*, American Society for Metals, Cleveland, 1953.
4. C. H. Hack, *Metals Handbook*, 1948 edition, p. 1065, American Society for Metals.
5. J. H. Shoemaker, "Preparing Cast Iron Surfaces for Bonding," *Sleeve Bearing Materials*, American Society for Metals, Cleveland, (1949) p. 199.
6. B. J. Esarey, "Bronze-Backed Bearings," *Sleeve Bearing Materials*, p. 183.

QUESTIONS

Pits and holes on surface caused by sand . . . . . .

Details for small furnace to melt brass . . . . . .

Spotting out defect . . . . . Castings not round

Sand Probably Causes Defects

QUESTION We have been having a problem with surface pits and holes in our brass castings and have started mixing facing sand for our molders. We are using Redwood No. 6 sand, employing two parts old sand and mulling for 10 minutes. However, as yet we have not as smooth a finish and as clean a casting as we would like to have. Is there some type of facing you can recommend?

ANSWER Your mention of trouble with surface pits and holes suggests that something is wrong with your sand condition and practice. Perhaps if we had some of the defective castings to examine we might be better able to form an opinion. While it is possible that use of facing sand might help, we do not believe it is the answer. Few brass foundries follow that practice, primarily because it is another operation which slows down production and adds to the cost. Molding sands used in brass, bronze and aluminum foundries do not deteriorate as rapidly as those used in ferrous work due to lower pouring temperatures employed.

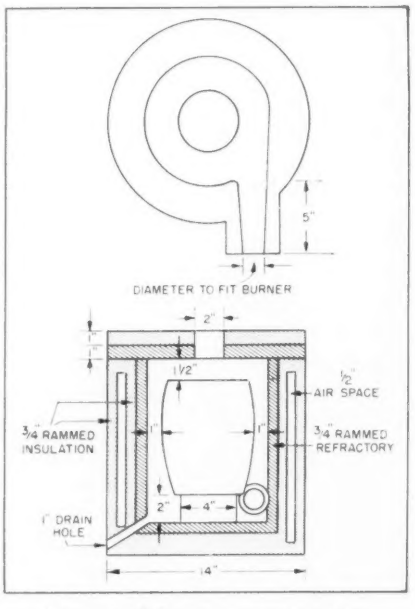
Sometimes where the sand used is a little too coarse to provide the desired surface smoothness, a finer sand is employed as a facing. Again the molding sand may tend to wash on some castings, and a facing composed of all new sand or large proportions of new sand is used. That provides a *stronger* sand or one with more bond. Possibly instead of using two parts old to one part new sand as indicated, you might obtain better results by trying only new sand in the facing. Observe the results, and then if desired you could try replacing part of the new sand with old to reduce the cost.

We do not have any information as to screen analysis, clay content, etc., of the sand mentioned so cannot make any suggestions. It appears to us that it would be well to have your sand tested to determine its properties and characteristics. From those data you should be able to determine the direction in which to proceed to minimize your troubles.

Small Brass Melting Furnace

QUESTION We want to build an oil-fired small brass furnace for producing castings as a hobby, and would appreciate information on construction details. We are going to use a No. 10 crucible and have a blower with a 5-in. blade and 2-in. outlet.

ANSWER While we are not furnace designers we are submitting a proposal shown in the accompanying sketch which we believe will operate satisfactorily. From some experimental work by Eggleston a number of years ago indications were that the space between crucible wall and furnace wall should be kept small—just sufficient that the tongs can be inserted to remove the crucible—and we have used 1 in. Eggleston also indicated greater efficiency where the exit flame traveled down the outside of the furnace between the two insulation linings; the crucible top is sealed against the cover.



Suggested furnace construction

Since that makes construction a little complicated, as well as having the exit flame coming out around the bottom of the furnace, we have substituted a closed air space for additional insulation. Constructed in the manner indicated, the shell of the furnace would be 14 in. Both refractory and insulation material are rammed in place using shells to obtain desired thicknesses. For proper burning of oil to obtain most satisfactory and efficient combustion, it is essential that it be finely atomized and mixed with the correct amount of air. To obtain these results, it is preferable to purchase an oil burner rather than to try to construct one yourself.

Troubled With Spotting Out

QUESTION We are sending you four furniture hardware castings—escutcheons for drawer pulls—with which we are having considerable trouble indicated by the "spotting out" on the three finished specimens. Castings are 3/32-in. thick and made from ingot metal or ingot and clean return scrap. Ingot shows 68 per cent Cu, 1.0 per cent Sn, 3.5 per cent Pb, 0.30 per cent Fe, 0.30 per cent Ni and remainder Zn. Metal is brought to a slight flare in oil-fired crucible furnaces, deoxidized with Al and poured immediately at 2000 to 2100° F. We use 7 oz Al to 190 lb ingot, or 3 oz to a mix composed of 45 lb ingot and 145 lb clean returns. Sand used is No. 0 Albany. Castings are polished and colored or given a patina with sulphur compounds and acid, and then lacquered. Spots appear any time from one day to three weeks and seldom are connected with visible cracks or other defects, but seem to follow microporosity. Trouble does not occur with heavier sections. We tried thinning out the center section to obtain a better solidification pattern, but the spots moved to the thicker section at the edges. Do you believe the castings can be made more dense or would you advise us to direct our energies to ob-

tain more effective cleaning after the coloring operation and before lacquering?

ANSWER Examination of several of the castings under the magnifying glass as to surface and structure on fracture indicates a possible combination of causes rather than a single one. As you state, the spotting out does not occur on many of the tiny but visible defects. We believe this is because the defects are large enough to become filled with grease compound used in buffing previous to dipping in the coloring solution. The compound is not removed in the alkali cleaning operation, and consequently prevents the coloring dip from entering or wetting the surfaces of the defects. However, with the very fine defects — or porosity as you term them—the grease compound does not penetrate, and the dip can enter.

Surface of the unfinished specimen shows numerous small pits, many of them filled with sand grains, and possibly small aluminum oxide folds or inclusions. This condition, we believe, is the cause of major or visible defects which persist after the polishing and buffing operations. Presence of the sand grains indicates a sand on the weak side with a tendency to wash. Admittedly the condition is slight, and in many cases might be considered normal. However, with these thin castings, where only sufficient metal is removed to "clean up" the surface, the as-cast surface must be as smooth and clean as possible. An increase in green compression strength may be the remedy.

Cause of the porosity, as you term it, is shrinkage, which is somewhat unexpected in such thin castings. It is just visible to the naked eye on the fracture. Thinning out the center, as you mention, did not remove that condition entirely in that area, but it did shift the shrinkage to the heavier edges. The remedy is to get sufficient metal into the cavity under conditions which will provide directional solidification. Essentially that is a matter of gating although possibly better control of pouring temperature might be considered. Ideally the most suitable pouring temperature would be that which provides the metal with sufficient fluidity to fill the cavity completely, and permits the metal to solidify progressively from points farthest from the gate to the gate itself, which is the last to freeze or solidify.

Use of aluminum, which you indicate, promotes fluidity or running characteristics of yellow brass and permits use of lower tempera-

Thin casting shows shrinkage. Photograph is about twice actual size

tures. Get a pyrometer and establish the lowest pouring range at which full-run castings are obtained, and see that pouring always is done in that range.

With reference to aluminum, it seems to us that you are using too much if Colton's investigation of the effect of that element on brass is any criterion. His results as reported in the *Transactions* of the American Foundrymen's Society, 1950, indicate that the aluminum content should be about 0.2 per cent. If it is much below or above that level, trouble is encountered through folds due to the oxide film being too thin or too thick. Brasses or bronzes containing aluminum must be gated so that nonturbulent flow is accomplished, otherwise the oxide skin or film tends to rupture and be washed into the metal. For the same reason pouring must be steady and uniform.

It might be pointed out in any case that the rinsing operations after coloring must be thorough to minimize "spotting out" since any traces of the solutions left on the surface will cause discoloration. We gather that the procedure after buffing is to use an alkali cleaner to remove the buffing compound and then rinsing. Cleaned castings then are dipped in the polysulphide to obtain the desired color, rinsed, dipped in the dilute sulphuric acid to "set" the color, and rinsed again. This last rinse must be thorough and preferably done in running water. Dried castings then are "highlighted" or relieved with a dry buffing operation.

Cylinder Castings Not Round

QUESTION We operate a foundry in France and are engaged in producing cylinders which are 83 mm OD and 65 mm ID by the shell molding process, using shell cores also. So far we regularly obtain eccentric castings. The average dimensions show the following for ordinary bronze: 81.6 mm across the parting line and 82.6 mm normal to the parting line for outside dimensions. For internal measurement the figures are 65.0 mm across the parting line and 65.8 mm normal to the parting line. We experience the same difficulty with aluminum castings, but it is more pronounced with cast iron cylinders, which show 81.5 mm across the parting line and 83.5 mm normal to it. Measurement of shell molds and cores before pouring show that they are perfectly cylindrical. We are enclosing a drawing indicating desired and resulting form of the cylinders.

ANSWER Your difficulty with obtaining true cylinders is not uncommon in shell molding, and apparently is due to mechanical action resulting from the rib effect or stiffening action performed by joining of the two mold sections at the parting line. One method of correcting the trouble is modification of the pattern and corebox to accommodate the differences in dimensional results. Other possibilities include increasing the strength of the resin-sand mix, increasing the thickness of the shell mold wall, and seeing that the backing ma-

terial supports the mold wall properly.

Still another procedure would be to incorporate a stiffening wire or rod along the top of the mold. This requires additional steps since the pattern would be invested with the resin-sand mix for 5 to 10 seconds, the dump box rolled back and moved. Then the stiffening wire or rod is placed in position along the top of the shell and sprinkled with a little resin-sand to hold it in place. Pattern and shell are cured in the oven for about 20 to 30 seconds and then reinvested for 5 to 10 seconds. Shell mold then is cured for 1½ minutes.

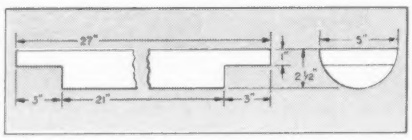
In studying the dimensions you give, it appears to us that insufficient contraction or "shrinkage" allowance has been made on the pattern. You indicate that across the parting line the dimension is 81.6 mm as compared to the desired 83 mm, or a difference of 1.4 mm. Usual contraction or shrinkage allowance for bronze is 3/16-in. per foot or 1.562 per cent. On the 83-mm dimension that would amount to about 1.3 mm or almost the same as the previously mentioned difference of 1.4 mm. Here, of course, we are assuming that the dimension of the shell mold across the parting line is fixed or held constant by the rib or stiffening effect of the mold joint.

Casting Turns Up On the Ends

QUESTION We are enclosing a sketch of a gray iron casting, solid throughout and half round in design. Overall length is 27 in. with a projection 3 in. long, 1 in. thick and 5 in. wide at each end. We are having considerable difficulty in keeping this casting perfectly straight. We have a tolerance of only 1/16-in., and the casting tends to bow upward at the ends; the distortion comes principally at the extended ends. Can you tell us how to correct this bowing or warping?

ANSWER Difficulty with the bowing or warping of this casting is due to the difference in solidification or cooling rate between the light section ends and the heavy body between them. Several procedures are available to keep the bowing or warping to a minimum. Simplest method is to scrape away the sand on the central portion as soon as the iron solidifies which exposes it to the air and permits faster cooling.

Another method is to "fake" the pattern by giving it a camber or bend in the opposite direction to the present bow, just sufficient to counteract that condition—probably about one-half the difference between ends and center. Other possibilities are use of denseners or chills under the center portion separated from the casting cavity by a thin layer of sand; use of dry sand cores to form the thinner



Warpage at ends causes trouble

ends of the casting; gating into the thinner ends, and use along the center portion of a molding medium which has a higher heat conductivity than green sand. This could be accomplished by use of zircon sand facing, mixing metallic shot or grit with the sand, etc.

Tumbling of Brass Castings

QUESTION In our foundry an alloy containing 67 per cent Cu, 1.0 per cent Sn, 2.0 to 3.5 per cent Pb, 0.30 per cent Ni, 0.20 per cent Fe, and remainder Zn is used to make small furniture hardware castings. Alloy is deoxidized with Al. At times the tumbling room complains that the castings simply will not respond to the action of the mills. They tend to become hard and brittle and show no improvement in finish. We wonder if the closer control of the Pb content and of the Cu to Zn ratio would eliminate this problem. We constantly are searching for the ideal analysis and would appreciate any suggestions.

ANSWER We suspect that your difficulties in results obtained on tumbling of the small castings may arise from variations in compositions since Al, Sn and Fe tend to harden yellow brass. The only way to determine whether or not such variations have any effect is to analyze the two types of castings carefully for the elements mentioned and observe the differences.

Again the trouble may arise in connection with the tumbling operation itself—that is, relationship of load, abrasive material, speed of rotation, etc. According to some information we have seen on tumbling, the cleaning action depends upon the sliding of the parts or pieces on each other and the abrasive material; not upon the pressure, and it is claimed that the fastest work is done when the barrel is about half full. Sliding or cleaning action cannot be accomplished on all surfaces of the pieces just by letting them slide over each other, so various other materials such as balls, stars and other metallic shapes, sand, rock chips, etc., are added. Proportions of the abrasives to the pieces to be cleaned vary by *volume* from 1 to 1 to 6 to 1. Generally the larger and heavier the piece or part, the higher the ratio.

Size of the abrasive material also will have a bearing; in general the larger and heavier the abrasive the greater the action on corners and exposed surfaces, but the poorer the action on protected surfaces and recesses, and also the poorer the finish. Proper speed of the barrel should be such that the load, including the abrasive, is carried up about three-fourths the inside diameter and then falls back or over itself, according to one expert, while another mentions a speed of 5 to 35 rpm for a 30-in.-diam barrel or about 40 to 275 surface feet per minute.

From the foregoing you can see that there are a number of variables and it might be worthwhile to experiment with changing one at a time to establish the most suitable operating conditions.

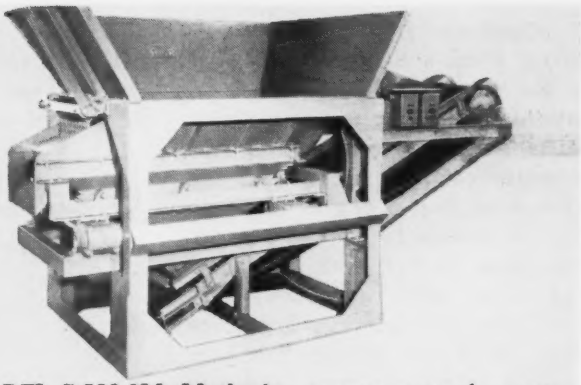
Pinholes Show Up On Castings

QUESTION Occasionally we pour a batch of cast iron stove tops which are full of pinholes that do not show up until the tops are ground, and they persist regardless of how much is ground off. Some claim that the tops are poured too hot, others that the metal is too cold, that it is the moisture in the sand, or it is due to the metal. We use Albany sand, and our scrap is selected carefully.

ANSWER In your list of possible causes of pinholes one has been left out, and it might be worthwhile to look into it. That one is the presence of gas in the metal re-

(*Concluded on page* 110)

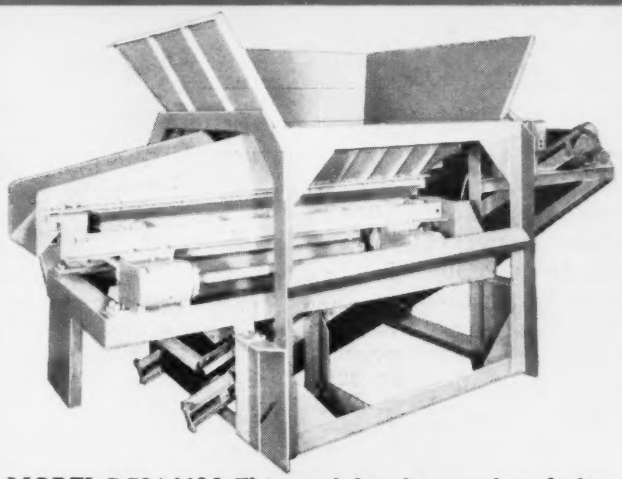
"mechanization" YOU can afford!



MODEL S-522-9M. Made for use as part of a centralized sand system. The large open-sided hopper directs the complete charge from a front end loader onto a Royer Shake-Out where the large scrap is riddled out. Magnetic separation removes the fine scrap; sand is discharged into a Royer Sand Separator and Blender or the skip hoist to a muller.

The new series of Royer "Scrap Control", with its versatility of application, can supply a varied amount of mechanized casting removal, sand cleaning and conditioning. Here is a unit that puts "mechanization" within the reach of all . . . supplying the benefits of labor saving and production line operation at lowest possible cost.

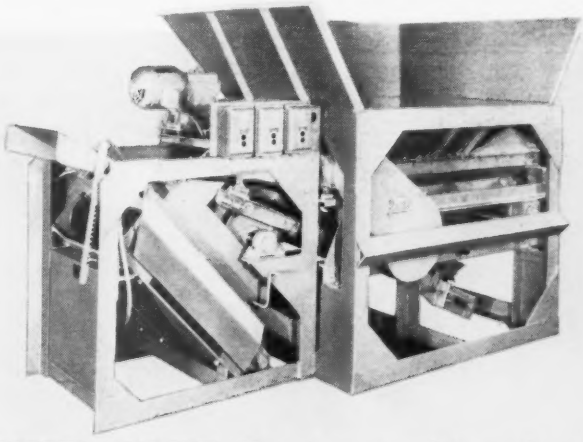
Take this opportunity to cut down the high cost of hand labor in your sand conditioning operations. Verified results show up to 50% of a night crew released for other work, with the damage by tramp iron to pattern equipment eliminated and scrap losses reduced 75%. We will be glad to study your operation and recommend the proper equipment . . . no obligation, of course.



MODEL S-724-11M. This model is designed to shake-out castings and clean sand in one operation. Sand and castings scooped from the molding floor are charged into the hopper and onto a Royer Shake-Out. Castings are discharged at one end at proper height for feeding a table or conveyor where they can be sprued and sorted. Completely cleaned sand is discharged at the opposite end.

CHECK THESE FEATURES

1. **Up to 60 tons of clean sand per hour.**
2. **No pits . . . no excavating.**
3. **Low receiving hopper.**
4. **High sand and scrap discharge.**
5. **Rugged Shake-Out utilized as a riddle.**
6. **No screens to clog.**
7. **Easily made portable.**
8. **Readily relocated.**
9. **Four-sided 5 ton capacity hopper available for all units.**



MODEL S-522-5MR. Here is a complete packaged sand cleaning and conditioning unit. Fed by front end loader, the sand is cleaned by a Royer Shake-Out and magnetic separator, tempered and given final preparation by a Royer Sand Separator and Blender. Unit can be moved by overhead crane, setting up the conditioning operation where desired.

Foremost in Sand ROYER *Conditioning Equipment*

ROYER FOUNDRY & MACHINE CO. 159 PRINGLE ST. KINGSTON, PA.

(*Concluded from page* 108)
sulting from a damp sand bottom in the cupola, a spout not dried out thoroughly, or use of pouring ladles not properly dried. If the defective castings occur with the first metal poured any of the three may be responsible, but if they appear later in the heat, we would look to the ladles introduced some time after pouring has begun, or those on which the lip has been patched with damp mud. However, when the lip is patched usually only the first metal poured is affected by the moisture.

This does not rule out the other causes mentioned except that of metal composition which we doubt is responsible. It may be that the sand is on the edge as far as permeability is concerned, and if rammed a little too hard or the metal poured hotter than normal, the metal will not lie quietly on the sand. Gases unable to escape are just sufficient to cause a slight but perceptible agitation or boil. When the condition is exaggerated, blows occur. If the moisture is a little too high, the same condition might exist. It would appear to us that if the metal is poured too cold that you would run into cold shuts. Still another possible cause of pinholes is use of excessive amounts of seacoal in the facing sand.

Various Parting Agents Used

QUESTION We operate a gravity die casting or permanent mold foundry in South Africa, and in making the molds we use plaster as well as combinations of clay, wood, plaster, metal and plasticene. We have tried many parting compounds, but none seem to serve successfully on all the materials mentioned. On investment molding, liquid wax appears best while for plaster, petroleum jelly and immersion in water work well. However, when using clay or wood patterns even after varnishing, it does not work so well.

ANSWER So far as we can ascertain, there appear to be as many types of parting mediums for plaster molding as there are foundrymen using the process. In addition to a number of proprietary materials the following have been mentioned: Petroleum jelly in two parts kerosene; lard oil; light lubricating oil 25 per cent, kerosene 75 per cent, wetting agent 1 per cent; oil-wax compounds; liquid potash soap; paraffin oil; ¼-lb stearic acid in 1 pint kerosene, and water-emulsion floor wax.

One practice employed to aid in separating plaster from the pattern is use of compressed air. In this one or more nails about 3/32 or ⅛-in. in diam are placed in position on the pattern and held prior to pouring in the plaster slurry. When the plaster air-sets the nails are removed and the nozzle of a compressed air hose inserted in the hole left by the nail. Usual compressed airline pressure will exert sufficient force to start separation.

Defects Appear Along Joint

QUESTION We are sending for examination a piece of gray iron showing a flaw that we would like to have classified, and also a remedy. Piece is from a cylinder liner 4 in. in diam and 8 in. long with a wall thickness of ⅜-in. which is machined to ⅛-in. as in the specimen by removing ⅛-in. from outer and inner diam. We gate into a section of metal outside the casting which is cut off in the machine shop. Flaws show up in a straight line right at the parting. Pattern is parted long way. We thought it was a sand flaw so put a fillet between pattern and plate which helped some. Could molybdenum ladle addition cause this? Sand or slag?

ANSWER Examination of the pieces shows several small holes which in our opinion are blows caused by moisture or water vapor. Reasoning is based on appearance of the interior of holes which show a dull, bluish color indicative of oxidizing gases. We suspect that the reason the holes only appear along the parting line is due to hard ramming of the sand along the outer edge of the pattern.

Possibly the sand may be on the "weak" side, and the molders resort to hard ramming to get away from drops or stickdowns. Again it may be that the molders are ramming just a little harder than necessary. Therefore, we suggest that ramming conditions in the mentioned area be studied, and try to obtain a happy medium of ramming just sufficiently to prevent swells and hold the sand in place. Perhaps it may be necessary to increase the green strength of the sand.

"Mood Gorning, Miss—what kind of an apply did you wish to position for?"

Hundreds of hours longer . . .

NORBIDE® Pressure Blast Nozzles

outwear any other type

- 750 hours using silica sand
- 1500 hours using steel shot or grit
- Air consumption decreased from 10 to 20 per cent
- Stream contour and abrasive velocity maintained

For YOU, this means

More Service per Dollar

For full details on cost-cutting NORBIDE Nozzles, write for your free copy of Form 543.

NORBIDE®... *the longest nozzle life you can buy*

NORTON
BORON CARBIDE

NORTON COMPANY

43 New Bond Street • Worcester 6, Mass.

Making better products . . . to make other products better

MEN OF INDUSTRY

JAMES R. HEWITT
. . . joins Texas Foundries

W. A. WRIGHT
. . . Attwood Brass supt.

P. S. HOFFMAN JR.
. . . Donegal Mfg. Corp. v.p.

GEORGE L. HOOBLER
. . . technical research, INCO

JAMES R. HEWITT has been named assistant to the president, Texas Foundries Inc., Lufkin, Tex. He was graduated from Lehigh University, after several years as a metallurgical assistant for Bethlehem Steel Co., Sparrows Point, Md. Mr. Hewitt was associated with Republic Steel Corp. in Youngstown, O., and South Chicago, Ill., and in 1935 joined American Manganese Steel Division, American Brake Shoe Co., as metallurgist and later was vice president-operations. Recently he had been president, Hewitt-McGrail Co., Houston, Tex., southwestern district representative for a number of companies serving the steel, foundry and manufacturing industries. He is vice chairman of the Texas Chapter of the AFS.

♦ ♦ ♦

Fred C. T. Daniels has retired as vice president of research and development, Mackintosh-Hemphill Co., Pittsburgh, but will continue in a consulting and advisory capacity. A graduate of Worcester Polytechnic Institute, he joined the company in 1904. From 1912 to 1928 he was associated with the former Pittsburgh Iron & Steel Foundries Co., Midland, Pa., and Wheeling Mold & Foundry Co., Wheeling, W. Va. He returned to Mackintosh-Hemphill in 1928 and has been a vice president the last 26 years.

♦ ♦ ♦

C. J. Mayo has been appointed general sales manager, Insul-8-Corp., Burlingame, Calif. He has been in crane and monorail sales for more than 15 years, recently as western representative for overhead handling systems, Whiting Corp., Harvey, Ill.

W. A. Wright was recently appointed foundry superintendent, Attwood Brass Works Inc., Grand Rapids, Mich. He studied at Rensselaer Polytechnic Institute and was associated with the foundry of the W. & L. E. Gurley Co., Troy, N. Y. After a period in the testing department, Watervliet Arsenal, Watervliet, N. Y., Mr. Wright became a foundry consultant.

♦ ♦ ♦

P. S. Hoffman Jr. was recently elected vice president-manufacturing, Donegal Mfg. Corp., Marietta, Pa. He was associated with Treadwell Engineering Co., Easton, Pa., until 1950, when he became metallurgist for Donegal and since then has been foundry superintendent and more recently works manager.

♦ ♦ ♦

Harry E. Gravlin has been appointed vice president and general manager of the Claude B. Schneible Co., Detroit. Mr. Gravlin was graduated from Wayne University and received master's degrees in automotive engineering and industrial management from University of Michigan and Massachusetts Institute of Technology, respectively. He joined Ford Motor Co. in 1939, and was production manager of its Dearborn Iron Foundry until earlier this year when he became general production superintendent of the Lincoln-Mercury assembly plant, Wayne, Mich. Mr. Gravlin was chairman of the Detroit Chapter of the AFS in 1953-54.

♦ ♦ ♦

Charles K. Garrison has joined Calumet Steel Castings Corp., Hammond, Ind., as sales manager and engineer of alloy steel castings.

George L. Hoobler, since 1951 in the ductile iron section, Development and Research Division, International Nickel Co., New York, has been transferred to the division's Pittsburgh technical field section. Mr. Hoobler was graduated from Marquette University and received his master's degree in mechanical engineering from Newark School of Engineering. In 1947 he joined the company's technical department at its Bayonne, N. J., works.

♦ ♦ ♦

M. E. Hartz has been named general manager, Fall River Foundry Co., Fall River, Wis., subsidiary of Badger Meter Mfg. Co., Milwaukee. A graduate of University of Akron, he became chief engineer, Kiekaefer Corp., Cedarburg, Wis., in 1944. He joined Badger Meter in 1949 as chief engineer, and supervised construction of the recently completed Fall River foundry. **Robert Ashley,** formerly superintendent at Badger Meter, has been appointed superintendent at Fall River.

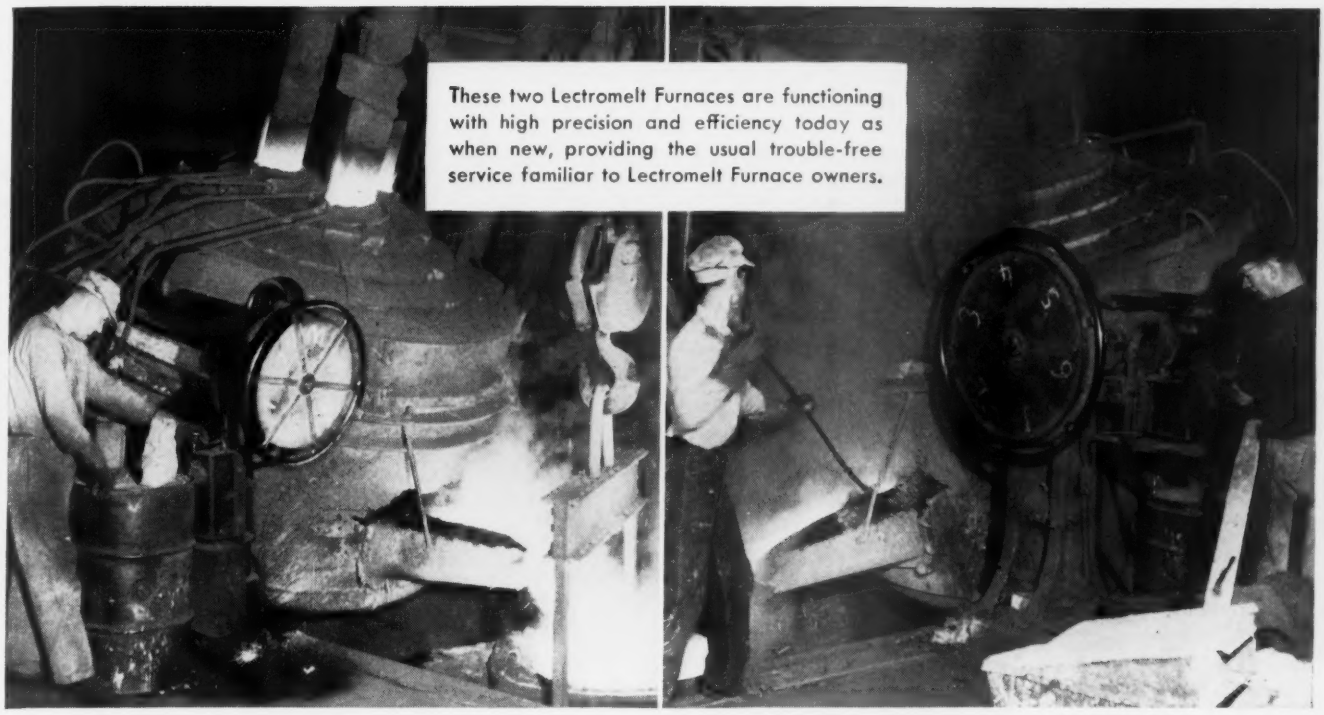
♦ ♦ ♦

William Hagel has been appointed vice president-executive assistant, United Engineering & Foundry Co., Pittsburgh. He joined the company in 1917. **Clark H. Johnson,** formerly manager of machinery sales, has succeeded Mr. Hagel as vice president-sales. He has been with the company since 1930.

♦ ♦ ♦

Silas G. Jones was recently appointed foundry engineer, Commercial Steel Casting Co., Marion, O. His previous associations include Lake

(*Continued on page* 114)



These two Lectromelt Furnaces are functioning with high precision and efficiency today as when new, providing the usual trouble-free service familiar to Lectromelt Furnace owners.

MORE THAN 80,000 HEATS SINCE 1918

MORE THAN 35,000 HEATS SINCE 1942

. . . at Farrell-Cheek Steel Company, Sandusky, Ohio

Thirty-five years of experience, engineering and research, and an understanding of your melting needs go into every Lectromelt* Furnace. Each new idea is proved in actual production at several installations before being applied as part of Lectromelt design.

With more electric furnaces in successful operation throughout the world today than any other manufacturer, Lectromelt engineers qualify to build the most modern, practical electric arc furnaces.

If you are considering purchase of a new electric furnace, be confident that a new Lectromelt Furnace will give you high performance and efficient operation long after your investment is amortized. Ask a long-time operator of Lectromelt Furnaces, like Farrell-Cheek, about the quality of Lectromelt equipment.

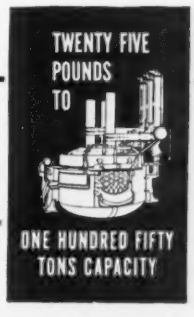
Write for the Lectromelt Furnace Bulletin No. 9. Pittsburgh Lectromelt Furnace Corp., 314 32nd Street, Pittsburgh 30, Pa.

Manufactured in . . . GERMANY: Friedrich Kocks GMBH, Dusseldorf . . . ENGLAND: Birlec, Ltd., Birmingham . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa. JAPAN: Daido Steel Co., Ltd., Nagoya

*REG. T. M. U. S. PAT. OFF.

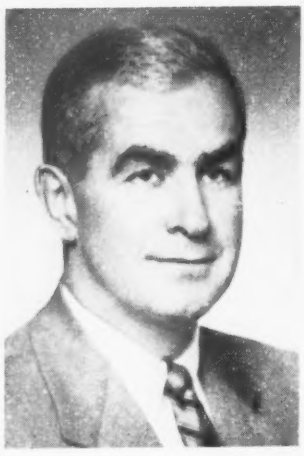
MOORE RAPID

WHEN YOU MELT... *Lectromelt*



MEN OF INDUSTRY

DUNCAN M. WILSON
. . . *Rochester Chapter chairman*



ROBERT B. PARKER
. . . *personnel, Brake Shoe*

N. GEORGE BELURY
. . . *Brake Shoe sales v. p.*

SEYMOUR A. SHAW
. . . *Fahralloy plant supt.*

(*Continued from page* 112)
City Malleable Co., Cleveland, National Malleable & Steel Castings Co., Sharon, Pa., and Pittsburgh Steel Foundry Corp., Glassport, Pa.

♦ ♦ ♦

Duncan M. Wilson, chairman of the Rochester Chapter of the AFS for the current year, is plant superintendent, Engineered Castings Division, American Brake Shoe Co., Rochester, N. Y. He received his technical training at Massachusetts Institute of Technology and joined Brake Shoe in 1942. Associated first with the American Manganese Steel Division, he was metallurgical assistant in Chicago Heights, Denver and St. Louis. Following Army service he was assistant metallurgist in Mahwah, N. J., and since 1948 he has been with Engineered Castings Division. Mr. Wilson was vice chairman of Rochester Chapter last year.

♦ ♦ ♦

Cheever H. Ely has been appointed Cleveland district manager, Norton Co., Worcester, Mass., succeeding **Fred P. Hays,** who has held the position since 1936 and has retired after 38 years with the company. Mr. Ely joined Norton in 1927 and spent a year in the Detroit sales office prior to becoming office manager of the Cleveland warehouse. Since 1938 he has been in the Dayton office, where **William C. Davidson** has succeeded him as abrasive engineer. Mr. Davidson has been with the company since 1946 and for the past year has been abrasive engineer in the West Virginia territory.

♦ ♦ ♦

N. George Belury has been appointed sales vice president, and **Robert B. Parker,** assistant to the president for personnel, American Brake Shoe Co., New York. Mr. Belury, who continues as president of the Engineered Castings Division, joined the Brake Shoe and Castings Division in 1937. He became sales manager of the Engineered Castings Division in 1947, division president in 1948, and vice president of the company last year. Mr. Parker, formerly in charge of commercial research and apprentice recruiting, joined Brake Shoe in 1942 and became assistant to the president in 1944.

♦ ♦ ♦

Seymour A. Shaw has been appointed plant superintendent, Fahralloy Co., Harvey, Ill., succeeding **David Napoli,** who has resigned. Since joining the company 18 years ago Mr. Shaw has held various positions in the operations phase of alloy castings production.

♦ ♦ ♦

Henry D. Phillips was recently named vice president in charge of operations and sales, Adirondack Foundries & Steel Inc., Watervliet, N. Y.

♦ ♦ ♦

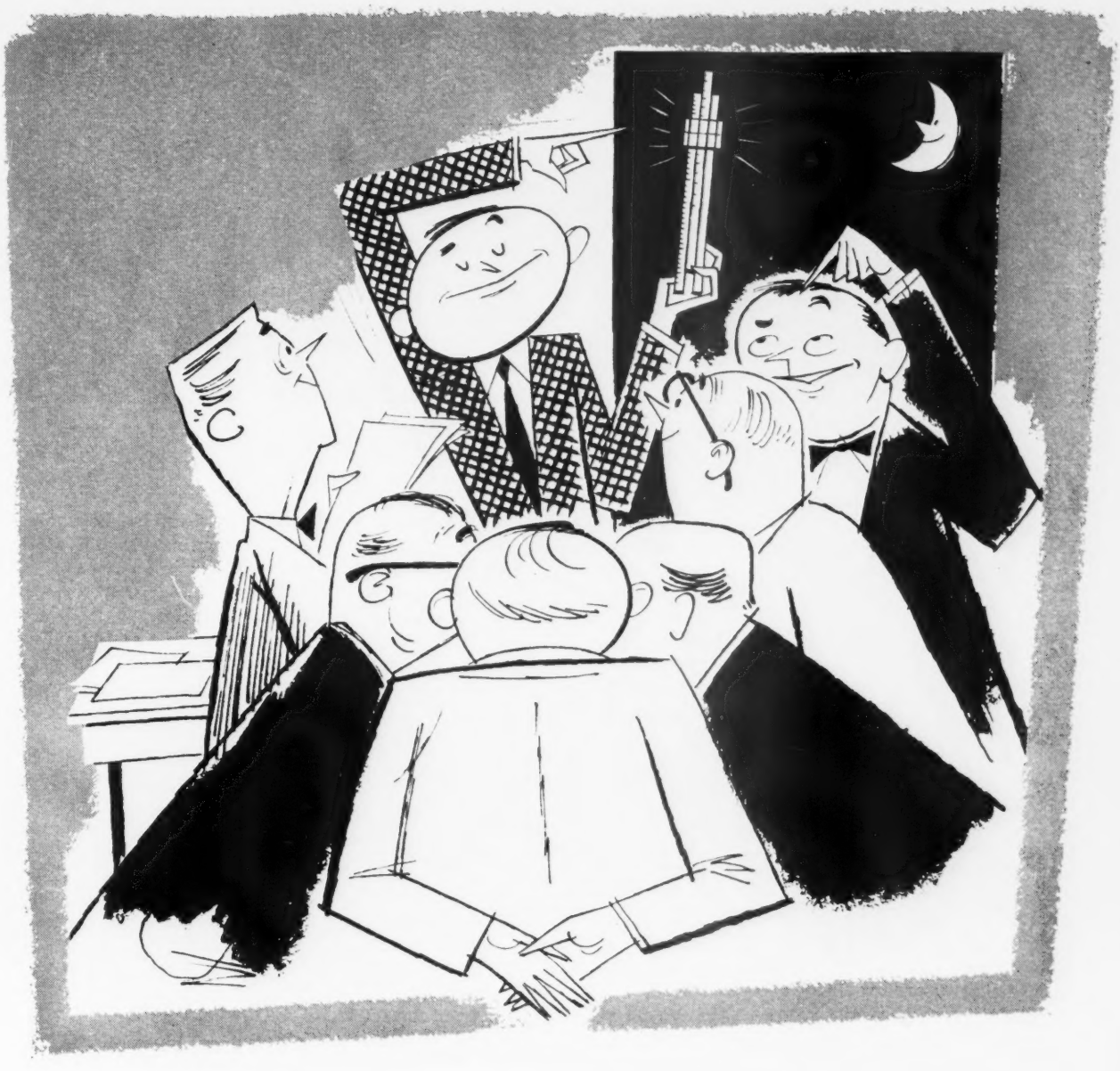
Ray P. Dunn, formerly plant metallurgist at the Chicago plant of Doehler-Jarvis Division, National Lead Co., New York, has been named director of metallurgy, U. S. Reduction Co., at East Chicago, Ind., and Toledo, O. Prior to 12 years with
(*Continued on page* 116)

CHEEVER H. ELY
. . . *Norton district mgr.*

FRED P. HAYS
. . . *retires, Norton Co.*

WILLIAM C. DAVIDSON
. . . *abrasive engineer, Norton*

RAY P. DUNN
. . . *director of metallurgy*



Want better engineering service?

OUR outstanding engineering service—which provides design assistance and other technical advice—is one reason why users of pig, ingot and billet rely on Kaiser Aluminum.

Other important reasons include: our ability to produce to all standard specifications or to special customer specifications; our integrated production facilities which make us a dependable source of supply.

In addition, Kaiser Aluminum gives faster service and delivery on orders from our conveniently located plants at Newark, Ohio; Chalmette, Louisiana; Halethorpe, Maryland; Mead and Tacoma, Washington.

For prompt personal service, contact the Kaiser Aluminum sales office listed in your telephone directory. Kaiser Aluminum & Chemical Sales, Inc. *General Sales Office:* Palmolive Bldg., Chicago 11, Illinois. *Executive Office:* Kaiser Bldg., Oakland 12, California.

Kaiser Aluminum

The nation's largest supplier of pig, ingot and billet

MEN OF INDUSTRY

JAMES H. MOORE
. . . general mgr., Syracuse

JOSEPH LEAVERTON
. . . Hamilton Foundry engineer

FRED J. RUTHERFORD
. . . heads Ontario Chapter

J. F. B. JACKSON
. . . British foundry executive

(*Continued from page* 114)
Doehler-Jarvis, Mr. Dunn was associated with Emerson Electric Mfg. Co., St. Louis, and Electro-Manganese Corp., Minneapolis.

♦ ♦ ♦

James H. Moore has been appointed general manager of the new plant of Vacuum Metals Corp., recently opened in Syracuse, N. Y. Management, production and sales activities of the company, jointly owned by Crucible Steel Co. of America and National Research Corp., have been moved from Cambridge, Mass. Following graduate work at Massachusetts Institute of Technology, and Carnegie Institute of Technology, Mr. Moore was associated with Aluminum Co. of America. In 1946 he joined National Research Corp., Cambridge, where he became director of the metallurgical department.

♦ ♦ ♦

Dr. Howard W. Barlow, since 1944 dean of engineering, Agricultural and Mechanical College of Texas, recently was named director, Institute of Technology, Washington State College, succeeding **Dr. William A. Pearl,** who resigned to become Bonneville Power Administrator. Dr. Barlow, who joined Texas A. & M. in 1940, was also director, Texas Engineering Experiment Station, director, Engineering Extension Service, and consultant for the Civil Aeronautics Administration.

♦ ♦ ♦

Francis J. Brickle, assistant to the sales manager, Overhead Crane Division, Harnischfeger Corp., Milwaukee, has been appointed sales engineer of P&H overhead cranes in Chicago, succeeding **William H. DeHuff,** who recently became manager of the P&H Denver office. A graduate of Marquette University, Mr. Brickle joined Harnischfeger in 1951.

Joseph Leaverton was recently appointed chief industrial engineer, Hamilton Foundry & Machine Co., Hamilton, O. Mr. Leaverton joined the company in 1948, following graduation from Ohio State University. He previously served as foundry foreman, general foreman, and production engineer.

♦ ♦ ♦

Fred J. Rutherford, who has been elected chairman of the Ontario Chapter of the AFS for 1954-55, since 1949 has been district sales manager, Refractories Engineering & Supplies Ltd., Hamilton, Ont. A native of Hamilton, he attended high school and business college there. From 1935 to 1946, when he joined the sales organization of Refractories Engineering, he was engaged in oil and refractories sales in Canada. Mr. Rutherford was vice chairman of the Ontario Chapter last year.

♦ ♦ ♦

Walter E. Max has been appointed general superintendent, Buffalo Works, Worthington Corp., Harrison, N. J. He joined the company in 1934, and from 1936-1939 studied mechanical engineering at Iowa State College. **Harry P. Yount** has succeeded Mr. Max as manager of the service and erection department in Buffalo. **John J. Hoefner,** with Worthington since 1948, has replaced Mr. Yount as assistant department manager.

♦ ♦ ♦

Don R. Williams has been appointed Northwest division sales manager for Osgood-General, Marion, O. Mr. Williams will work with distributors in the area, including Western Equipment Co., Portland and Eugene, Oreg., Washington Machinery Co., Seattle, and Columbia Equipment Co. Ltd., Vancouver, B. C. His previous associations have been in equipment sales and distribution.

J. F. B. Jackson has been appointed deputy managing director of the recently opened foundries of A.P.V.-Paramount Ltd., Crawley, Sussex, England. He has been director of the British Steel Castings Research Association since it was organized in 1953 and for 4 years prior to that was director of the Research and Development Division, British Steel Founders' Association. In 1933 Mr. Jackson joined David Brown & Sons Ltd., Huddersfield, England, where he became technical superintendent of the steel, iron and bronze foundries in Penistone, and later chief metallurgist and technical controller in the head office. In 1946 he was appointed a director of David-Brown-Jackson Ltd., Manchester.

♦ ♦ ♦

Edward H. Freiburghouse Jr. has been named manager of the new mechanical engineering sub-section, Materials and Processes Laboratory, General Electric Co., Schenectady, N. Y. A graduate of Rensselaer Polytechnic Institute in 1943, he entered the company's training program and following advanced and creative engineering courses has been supervisor of the advanced engineering program for 3 years. The new subsection is an outgrowth of the laboratory's long established physical testing activities.

♦ ♦ ♦

Charles A. Glenn was recently appointed general sales manager, Lynchburg Foundry Co., Lynchburg, Va., where he will direct all sales activities, including pipe and castings. He joined the company in 1936. **T. M. Bost Jr.,** formerly assistant sales manager, has succeeded Mr. Glenn as castings division sales manager. Mr. Bost has been with Lynchburg since 1933. **John W. Jones,**

(*Continued on page* 118)

Q-ROK (Quartzite Blasting Abrasive) offers you lowest material and labor costs per square foot of cleaning. Because of its ideal hardness factor and excellent abrasive qualities, Q-ROK cleans faster without imbedding in metal, and it definitely reduces nozzle wear. Available in five sizes, there is a grade of Q-ROK for each cleaning need and every finish desired. For complete information and free samples mail the coupon to Pennsylvania Glass Sand Corp., leading producers of Quality Foundry Sands and Silica Flour.

"Don't give me excuses—

lower our cleaning costs"

And you can,
with Q-ROK!

PENN PGS CORP SAND

THE SURE START TO A PERFECT FINISH

© 1954 Pennsylvania Glass Sand Corp.

PENNSYLVANIA GLASS SAND CORPORATION
Two Gateway Center, Pittsburgh, Pa.

Please send me further information and sample of each PENN-SAND product checked below.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

☐ Molding Sand ☐ Core Sand ☐ Sandblast Sand
☐ Shell-Molding Sand ☐ Silica Flour

MEN OF INDUSTRY

ROBERT S. MINNING
. . . abrasive sales, Cleveland

FRED C. STOCKINGER
. . . Bay State district mgr.

EDWARD W. WEY
. . . Texas Chapter chairman

D. C. HART
. . . Federal Foundry sales

(*Continued from page* 116)
until recently yard superintendent at the Radford, Va., plant, has been named personnel assistant in charge of safety.

♦ ♦ ♦

Robert S. Minning was recently appointed northeastern Ohio representative, Cleveland Metal Abrasive Co., Cleveland. Since 1943 he had been associated with Consolidated Iron-Steel Mfg. Co., Cleveland, where he was director of purchases. Previously he was associated with the Erie Railroad for 11 years.

♦ ♦ ♦

David E. Perkins has been appointed New England sales representative, Harrison Abrasive Division, Metals Disintegrating Co., Elizabeth, N. J. A resident of Walpole, Mass., he has had previous foundry and sales experiences.

♦ ♦ ♦

Fred C. Stockinger has been appointed West coast district manager, Bay State Abrasive Products Co., Westboro, Mass. He became an abrasive engineer in the Cleveland office in 1946 and early this year was named mid-west regional engineer. Previously he was associated with Ex-Cell-O Corp., Detroit, in an engineering capacity.

♦ ♦ ♦

R. W. de Weese has been appointed vice president-sales, and **Jefferson J. Davis,** vice president-product divisions, Electric Steel Foundry Co., Portland, Oreg. A graduate of Stanford University, since joining the company in 1940 Mr. de Weese has served as division manager, assistant to the president, and managing head of the metallurgical and inspection departments. Mr. Davis was graduated from Washington State College and joined the company's Seattle branch in 1936. After serving as manager in Eugene, Oreg., he became co-manager of the Portland logging-rigging division, and since 1945 has been manager of the construction-equipment division which he organized.

D. C. Hart, formerly foundry superintendent, Posey Iron Works, Lancaster, Pa., has been named sales representative, Federal Foundry Supply Co., Cleveland, to cover eastern Pennsylvania, western New Jersey, Maryland and Delaware.

♦ ♦ ♦

Edward W. Wey, chairman of the Texas Chapter of the AFS for 1954-55, is vice president-secretary, Dee Brass Foundry Inc., Houston, Tex. A native of Hammond, Ind., he attended school in Houston, Tex., and from 1924 to 1938 was associated with the Southern Pacific Railroad. Following a period of sales work he joined Dee Brass Foundry in 1948 as vice president-sales manager. Mr. Wey has served as treasurer and last year as vice chairman of the Texas Chapter.

♦ ♦ ♦

C. D. Ridgway has been appointed manager of the Dallas, Tex., office, Corn Products Sales Co., New York. He joined the Edgewater, N. J., plant, in 1934, and after sales work in Philadelphia and Greenville, S. C.,
(*Continued on page* 120)

DAVID E. PERKINS
. . . Harrison Abrasive sales

JEFFERSON J. DAVIS
. . . v.p., Electric Steel

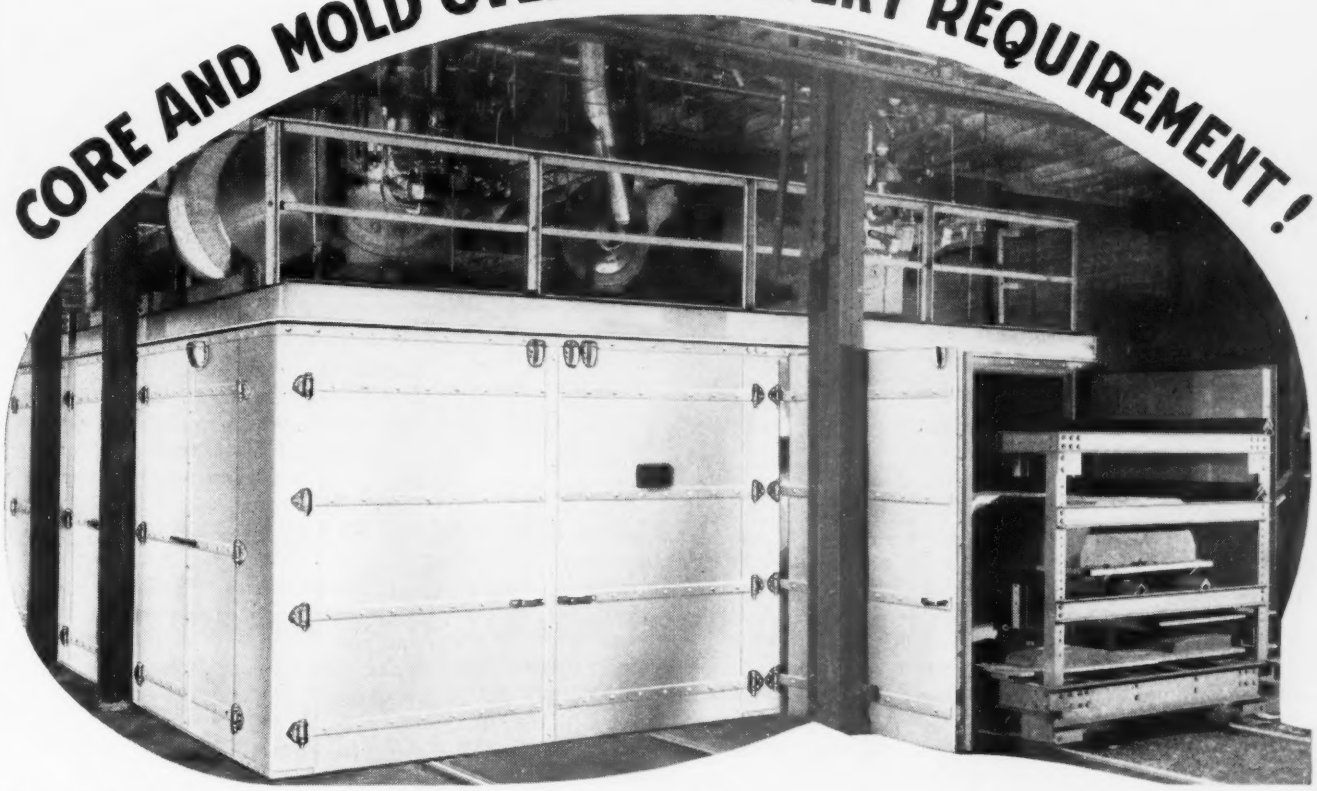
R. W. de WEESE
. . . Electric Steel v.p.

C. D. RIDGWAY
. . . Corn Products branch mgr.

CARL-MAYER

Foundry Ovens are versatile!

CORE AND MOLD OVENS FOR EVERY REQUIREMENT!



Typical List of CM customers:

If you are quality conscious, it will pay you to consult with Carl - Mayer engineers. Write for Bulletin No.53-CM.

Aluminum Co. of America
American Brake Shoe Co.
American Radiator Co.
Blaw-Knox Co.
Brown Industries
Buick Motor Div. of General Motors Corp.
Bucyrus-Erie Co.
Cadillac Motor Div. of General Motors Corp.
Columbia Steel Corp. (U. S. Steel Corp.)
Crucible Steel Castings Co.
Dunkirk Radiator Co.
Eclipse Aviation Division of Bendix Aviation Corp.
Electric Autolite Co.
Ford Motor Co.
Fremont Foundry Co.
G. & C. Foundry Co.
General Electric Co.
General Motors Corp. and Subsidiaries
Gilbert & Barker Co.
General Steel Castings Co.
Golden Foundry Co., Inc.
Henry Kaiser Corp.
W. O. Larson Foundry Co.
Mesta Machine Co.
F. E. Meyers & Bro. Co.
Oil Well Supply Co. (U. S. Steel Corp.)
Packard Motor Car Co.
Pittsburgh Steel Foundry Corp.
H. B. Salter Co.
Shenango Penn Mold Co.
Standard Foundry Co.
Union Brass & Metal Mfg. Co.
Union Steel Castings Co.
West Michigan Steel Castings Co.
A. C. Williams Co.
Whiten Machine Works
Whiting Corp.

CARL - MAYER TWO-COMPARTMENT CAR TYPE OVEN FOR CORES AND MOLDS. Each oven, 12′ wide, 26′ deep, 9′ high. One oven is used for baking large cores at night and has doors on side, permitting its use as a rack type oven during the day. Other oven is for night baking. Both compartments are individually heated by a Carl-Mayer recirculating type gas-oil heater enabling use of either gas or oil.

CORE OVENS, MOLD OVENS -- *all types*

THE CARL-MAYER CORPORATION
3030 Euclid Ave., CLEVELAND, OHIO

Backed by Over 30 Years' Experience

MEN OF INDUSTRY

(*Concluded from page* 118)

recently was staff assistant in the southern division office, Memphis, Tenn.

♦ ♦ ♦

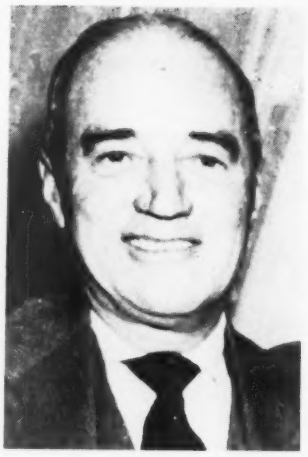
Prof. Harold O. Bolz has been appointed associate dean, College of Engineering, Ohio State University. Prof. Bolz was graduated from Case Institute of Technology in 1933 and received his master's degree in science there in 1935. He was a development engineer for Weatherhead Co., Cleveland, until 1938, when he became a member of the faculty, Purdue University. At Purdue Prof. Bolz was assistant professor of machine design, associate professor of mechanical engineering, professor of industrial engineering and until recently was head of the general engineering department. In his new position, Prof. Bolz will act as counsellor to third and fourth year students in the College of Engineering.

♦ ♦ ♦

Woodrow Holden, chairman of the Saginaw Valley Chapter of the AFS for the current year, is chief metallurgist, Foundry Division, Eaton Mfg. Co., Vassar, Mich. Mr. Holden was previously associated with General Foundry & Mfg. Co., Flint, Mich., Northville Foundry & Mfg. Co., Northville, Mich., and Hillsdale Foundry Co., Hillsdale, Mich. He supplemented his foundry experience with extension courses at General Motors Institute and University of Michigan. Vice chairman of the Saginaw Valley Chapter last year, he has also been active in committee work of the national organization.

♦ ♦ ♦

Ronald D. Gumbert was recently appointed a vice president of Mercast Corp., New York. He continues as executive vice president, Alloy Precision Castings Co., Cleveland, which is licensed to use the Mercast process to produce investment castings. Mr. Gumbert, who attended Carnegie Institute of Technology, joined Alloy Precision in 1952.



LAWRENCE R. TIERNEY, appointed vice president, Pennsylvania Foundry Supply & Sand Co., Philadelphia, as reported in November.

♦ ♦ ♦

Robert L. Reed has been appointed Pittsburgh district manager, Electro Metallurgical Co., division of Union Carbide & Carbon Corp., New York. A graduate of Ohio State University, he joined the company as sales engineer in 1946. Mr. Reed served in the Chicago and Detroit offices before going to Pittsburgh in 1953.

♦ ♦ ♦

James Suter has been appointed sales engineer, Frank G. Hough Co., Libertyville, Ill., where he will act as liaison between district representatives, sales and other departments. He has spent 4 years as district representative for the company and 2 years as assistant sales manager for a Hough distributor.

Eugene R. Oeschger, general manager, and **Alfred E. Blake Jr.,** manager-engineering, Foundry Department, General Electric Co., Schenectady, N. Y., recently spent 30 days investigating the latest technological advances in European foundries. Included in the tour were 16 foundries in France, Belgium, Switzerland, Italy, Sweden, Norway, Scotland and England.

♦ ♦ ♦

John M. Neff, assistant manager, has been named manager of the ceramics and minerals research department, Armour Research Foundation, Illinois Institute of Technology, succeeding **Dr. Einar P. Flint** who has become director of inorganic research, Mallinckrodt Chemical Works, St. Louis. Mr. Neff joined the foundation in 1946.

♦ ♦ ♦

George L. Knight Jr. was recently appointed metallurgist, J. C. Steele & Sons, Statesville, N. C. Mr. Knight was graduated from Missouri School of Mines and Metallurgy, and previously was in the training program at Lynchburg Foundry Co., Lynchburg, Va.

♦ ♦ ♦

R. M. Ovestrud, formerly foundry engineer, has been appointed assistant superintendent of the Lake St. plant, Minneapolis-Moline Co., Minneapolis.

♦ ♦ ♦

A. Rasmussen, recently vice president-plant manager, Fahralloy Corp., Harvey, Ill., has resigned. He joined the company as sales manager 12 years ago.

♦ ♦ ♦

John R. Howell has been named a director and sales manager, Sterling Electric Motors Inc., Los Angeles. He has been associated with the company for over 25 years.

WOODROW HOLDEN
. . . Chapter chairman

RONALD D. GUMBERT
. . . Mercast Corp. v.p.

ROBERT L. REED
. . . Electromet district mgr.

JAMES SUTER
. . . Frank G. Hough sales

Radiograph reveals several sand inclusions. These must be chipped out and repaired.

Later radiograph shows repairs have made the casting sound—saved the cost of re-casting.

RADIOGRAPHY

teams with Foundry know-how

to produce a sound high pressure valve body

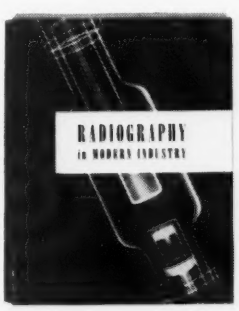
TO TAKE its place in a 300 psi system, this steel valve casting had to be sound. So, it was checked by radiography, revealing the presence of sand inclusions. These were chipped out and the necessary repairs made—a second radiograph showed a sound, homogeneous casting.

This is another good example of the way radiography is used to insure good work, avoid waste, and prevent service failures. It's another example of the way it can improve operations and increase business.

Perhaps you, too, can do this through the use of radiography. Talk to your x-ray dealer. Send for a free copy of "Radiography as a Foundry Tool."

RADIOGRAPHY

another important example of photography at work



RADIOGRAPHY IN MODERN INDUSTRY

A wealth of invaluable data on radiographic principles, practice, and technics. Profusely illustrated with photographs, colorful drawings, diagrams, and charts. Get a copy from your local x-ray dealer—price, $3.

EASTMAN KODAK COMPANY
X-Ray Division
Rochester 4, N.Y.

Kodak
TRADE-MARK

There is no substitute for *Highest Quality*

NEW, vastly improved MACKLIN B-5 Bond for all snagging operations is gaining new users all over the country. Try it on your next job.

As a result of extensive research, the MACKLIN new, improved B-5 resin bond is setting higher standards of performance. Faster cutting, with maximum wheel life, it is now giving MACKLIN B-5 users lower grinding costs.

We suggest you investigate the benefits of using the new B-5 MACKLIN wheels to lower your snagging costs.

Call your Macklin Distributor today!

MACKLIN COMPANY

***Manufacturers of* GRINDING WHEELS AND OTHER ABRASIVE PRODUCTS**

JACKSON, MICHIGAN

There is a MACKLIN Field Engineer in your vicinity. MACKLIN distributors are located in all principal cities, with ample stocks to fill your needs.

OPTIMISM MARKS NFA ANNUAL MEETING

Held In Chicago To Discuss Management Problems

By ROBERT H. HERRMANN
Associate Editor

INDUSTRIAL activity and management problems were discussed at the National Foundry Association 56th annual meeting at La Salle Hotel, Chicago, Oct. 7-8. At one of the luncheon sessions Dr. Leo Wolman, director, National Bureau of Economic Research, said that the 1953-54 recession was not as bad as that of 1948-49. The bottom was reached late last summer and business will increase gradually from now on.

George W. Cannon, G. W. Cannon Co., Muskegon, Mich., speaking at the concluding luncheon, sees much technical progress in foundries during the next five years. Production methods will improve through more mechanization, some automation and the design of buildings around equipment to get economical material and product flow. Business will be good but competitive. Good planning and production control, incentives for management and employees, fair labor relations, sound cost accounting and sensible budgeting will be needed.

First of the formal papers was "A Working Analysis of the 1954 Tax Reform Bill and Its Effect on Industry," by J. P. Goedert, chairman, Subcommittee on Long Range Planning, American Institute of Accountants. Changes in the new law are designed to close loopholes and eliminate inequities and deficiencies. For business concerns it provides liberalized depreciation practices and more leniency for loss carrybacks. Also funds may be held for expansion and new building and for research and experimental work. An accrual basis taxpayer may deduct from income, additions to a reserve for certain estimated expenses. Working capital of corporations with a tax bill of over $100,000 may be reduced by the requirement for advance payments on estimated tax.

John Perry, Straus and Perry, Washington, discussed "A Practical Program of Human Relations for Foundries." He said that the measure of human relations is the success with which people work together. On the other hand, conflicts sometimes are the best asset a company has. They often show active individual thinking for product or process improvement which is to the company's advantage. But the ideas of two or more persons may clash. According to Mr. Perry, it is poor practice to settle such disputes by overriding or compromise. Integration is the best way. It involves a settlement in which all involved get what they want based on what is best for the company.

He added that a good human relations program starts with the decision of management to change its policy for the better. Business information and company thinking should be shared with employees at all levels. And, management should hear and consider, seriously, the problems of any worker.

Company financial problems were discussed by Francis J. Calkins, director, Finance Dept., Marquette University, in his talk, "Cleaning Up Your Financial House." According to Dr. Calkins, ready cash is more important to a business than profit; a company can operate for a short time without profit.

A ready cash supply can be built with a sensible inventory procedure and with a good collection policy for accounts receivable. Slow expansion and careful watch over capital equipment investment also will preserve ready cash. The possibility of taking in a partner also should be considered. Issuing stock is a possibility although the cost is excessive for amounts less than $2 million.

If it becomes necessary to borrow money, short-term loans should be considered only to meet seasonal or emergency requirements.

First day meetings were ended with presentation of the paper "Time Study and Incentive Clauses in Union Contracts," by Phil Carroll, consulting engineer, Maplewood, N. J. He said that unnecessary and restrictive clauses in contracts can be avoided if union and company representatives will specify the plan of the contract properly.

Mr. Carroll advocated the use of standard data in setting rates. These data are an accumulation of time studies by several men. He also stressed the need of good administration to get satisfactory human relations in contracts. Time study will not substitue for good management.

"Collective Bargaining Problems,

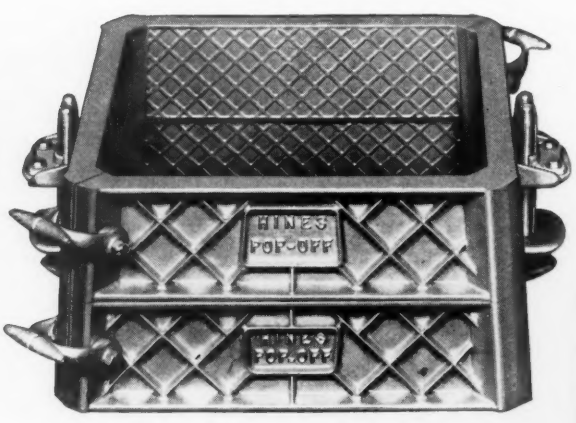
(*Concluded on page* 126)

Administrative council of the NFA held a luncheon meeting the day before the conference. Views of the meeting are shown here. Top view, standing left to right are Paul L. Arnold, United States Pipe & Foundry Co., NFA vice president elect; W. W. C. Ball, Taylor & Fenn Co., the new president, and Summerfield Brunk, Headford Brothers & Hitchins Foundry Co., the immediate past president

You've heard this before...

HINES POP-OFF FLASK

MEMBER FEMA



If you're not fully acquainted with the advantages of HINES POP-OFF FLASKS, please write us for complete information.

but it's worth repeating...

the HINES flask co.

3431 WEST 140TH STREET • CLEVELAND 11, OHIO • PHONE ORCHARD 1-2806

(*Concluded from page* 123)

Programs and Policies" was the topic at a panel session on the second day. Consensus was that a continuous management policy of good employee relations is better than waiting for emergency situations to arise before taking action.

Speaking of policies for a medium-sized foundry, R. R. Washburn, vice president, Plainville Casting Co., Plainville, Conn., said employees should be told about current business conditions and their effect on bargaining for contracts. He added that men never should be laid off as the result of new equipment or process installation. They should be transferred. Finally, a new installation should be discussed with each employee so that he will know its effect on him and the plant operation.

Robert Langsenkamp, president, Langsenkamp-Wheeler Brass Works Inc., Indianapolis, spoke for the small foundry. He stressed the advantages of person-to-person contact in management-employee relations.

W. W. C. BALL
President, NFA

Large foundries were represented by Charles R. Appel, personnel director, U. S. Pipe & Foundry Co., Chattanooga, Tenn. He emphasized the importance of setting company policy before bargaining and sticking to it. All conditions and agreements should be written in the contract.

R. J. Redmond, secretary, Buckeye Foundry Co., Cincinnati, told of advantages achieved by local foundries banding together to negotiate with unions. Absolute fairness in dealings is a must, as is the keeping of records of all discussions between union and management.

NFA officers elected for this year are: W. W. C. Ball, Taylor & Fenn Co., Hartford, Conn., president, and Paul L. Arnold, U. S. Pipe & Foundry Co., Chattanooga, vice president. Frank J. Sherwin, Chicago Hardware Foundry Co., North Chicago, Ill., was re-elected treasurer, and Charles T. Sheehan continues as executive secretary.

BUSINESS TRENDS AND POTENTIAL OF FOUNDRY INDUSTRY

Are Discussed at 32nd Annual Meeting of FEMA

By FRANK G. STEINEBACH
Editor

THIRTY-SIXTH annual meeting of the Foundry Equipment Manufacturers Association, held at the Greenbrier, White Sulphur Springs, W. Va., Oct. 14-16, was concerned with consideration of past and future trends in equipment business and the future potential of the foundry industry. The first day was devoted to product group meetings.

In opening the general sessions, William B. Wallis, Pittsburgh Lectromelt Furnace Corp., Pittsburgh, discussed the opening of a headquarters office in Washington. He also outlined the activities of various association committees.

C. R. Heller, new secretary-treasurer of the association, outlined the work of the Business and Defense Services Administration as it affects the machinery and equipment fields. He stated that the organization has authority to schedule shipments for defense and the Atomic Energy Commission, and to allocate materials for national defense. Much planning is under way, including the application of controls in case of an emergency.

C. V. Nass, Beardsley & Piper Co., Chicago, told of the highlights of his recent trip to a number of European countries. Mr. Nass was a representative of the American Foundrymen's Society at the International Foundry Congress in Florence, Italy, and he described that meeting. In his opinion, West Germany is the most potent industrial factor in Europe today.

Einar A. Borch, National Metal Abrasive Co., Cleveland, presented an interesting interpretation of FEMA statistical reports. He compared activities in the equipment industry with the curve of unfilled orders for gray iron castings, and suggested reasons for the two deviations. While long-range expansion was the most important factor in equipment sales in 1953, modernization of existing facilities became the biggest factor in 1954. Mr. Borch pointed out that 1954 is a good year, although there has been a slide from the peak due to lack of confidence. Many believe there will be a turn to better confidence in 1955.

Thomas Kaveny Jr., Herman Pneumatic Machine Co., Pittsburgh, reported on activities of the Foundry Educational Foundation, told of the service rendered the foundation by many individuals in the foundry equipment industry, and asked for continued financial support of FEF.

Mr. Kaveny pointed out that seven years ago only 11 men were engaged in teaching foundry practice in the 14 foundation schools, and seven of these were craft instructors. Today 55 men are engaged in the full-time teaching of foundry practice. In 1947 there were only 14 courses in foundry available in those schools and now there are 106. Over 6000 engineering students are taking courses each year in foundation schools; they represent over 25 per cent of the engineering enrollment.

Frank G. Steinebach, FOUNDRY, reported on the activities of the National Castings Council.

James H. Smith, Central Foundry Division, General Motors Corp., Saginaw, Mich., told the equipment manufacturers that he knew of no time when the future of the castings industry has been as promising as it is today. It has been demonstrated time and again that customers will favor castings over forgings, stampings and weldments, providing they can be produced to meet service and mechanical specifications at a competitive price.

Mr. Smith stressed that foundrymen must be ever alert to improve methods of producing castings, new developments, and anything which will produce a better casting at a lower cost. In the foundry industry, competition means harder work and more aggressive selling.

New directors announced at the meeting are as follows: Einar A. Borch, National Metal Abrasives Co., Cleveland; David E. Davidson, Link-Belt Co., Chicago; William B. Wallis, Pittsburgh Lectromelt Furnace Co., Pittsburgh. Officers were re-elected as follows: President, William B. Wallis; vice president, David E. Davidson; secretary-treasurer, C. R. Heller.

NOW! Every Core Comes CLEAN

with the NEW CP Core Box Vibrator

The Air-Powered CP Core Box Vibrator is the newest development in foundry equipment for core and pattern making departments. Cores weighing up to 3000 pounds are freed in less than 90 seconds. No more mallet work or sledging to loosen the core . . . just clamp the vibrator to the inverted box; its 9000 orbital vibrations per minute assure a perfect draw. Cores are free of flaws, damaged edges, distorted sections, dimensional variations . . . boxes remain in condition!

- **Reduces core box maintenance.**
- **Increases core output by eliminating troweling time.**
- **Cores stay true . . . core boxes don't go out-of-square.**

The fast acting air clamp of the CP-219-CBV grabs any cleat up to 6 inches . . . no special adaptors or fixtures are required. Write for details.

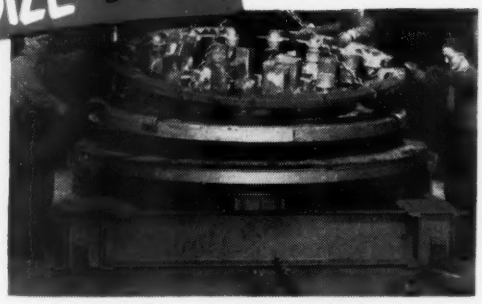
Chicago Pneumatic *8 East 44th Street, New York 17, N. Y.*

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

KING SIZE CLEANING PERFORMANCE ON A KING SIZE JOB

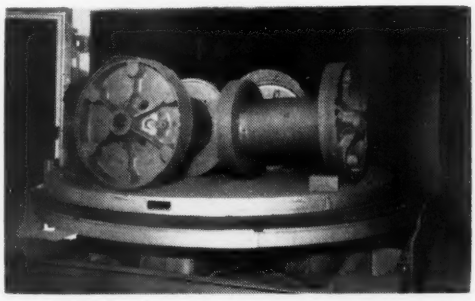
WHEELABRATOR ® ROOM cleans castings weighing from 1 to 20,000 lbs. each

A reduction of 32 man hours in direct cleaning room labor and a drastic slash in the cost of chipping and grinding were immediate results of the installation of this Wheelabrator Car-Type Room at AMERICAN HOIST & DERRICK CO., St. Paul, Minnesota. Every steel and gray iron casting produced in the plant is Wheelabrated . . . large castings weigh as much as 10 tons, while the smallest weighs less than one pound. Cleaning is accomplished in a fraction of the time required by the airblasting method previously used. For example, six large cable drums that are now Wheelabrated in five minutes would have taken more than an hour to clean by airblasting. You get king-size cleaning performance on any size job with a Wheelabrator. Send for full details today.



ABOVE: Loading and unloading time is materially reduced through use of auxiliary tables. One auxiliary table can be loaded while the other is in the cabinet being cleaned.

BELOW: Cleaning winch hoist drums in the Wheelabrator Car-type Room



Catalog 74-B explains the advantages of Wheelabrating and describes typical Wheelabrator Machines. Send today for a copy.

American

WHEELABRATOR & EQUIPMENT CORP.

505 S. Byrkit St., Mishawaka, Ind.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

D903

CASTING MARKETS, QUALITY AND COST

Are Topics at Michigan Regional Foundry Conference

By EDWIN BREMER
Metallurgical Editor

SESSIONS of the Michigan Regional Foundry Conference, held at the University of Michigan, Ann Arbor, Mich., Oct. 14-15, revolved around the themes of expansion of the casting market, improvement of casting quality and reduction of casting cost through engineering. Sponsors of the conference included these AFS chapters: Saginaw Valley, Western Michigan, Central Michigan, Detroit, and the student groups at University of Michigan and Michigan State College.

At the opening session, Prof. Richard A. Flinn, University of Michigan, introduced Dean George G. Brown, who welcomed those present. Dean Brown pointed out that facilities at the university were being increased to get away from the traditional teaching methods wherein the instructor does the demonstrations and the students look on. Now the procedure is to develop laboratories equipped with industrial equipment where the student becomes familiar with it and its operation. Also, the trend is toward a broader training in engineering rather than the specialized type.

Discussing "Casting Horizons," William G. Gude, managing editor, FOUNDRY, Cleveland, stated that since 1939 the number of foundries has increased from 4800 to 5400. During that period, the industry spent over $1 billion for expansion and improvement of casting facilities, resulting in an increase of nearly 1,200,000 tons in capacity. Value of castings produced last year was over $5 billion.

Referring to the future, Mr. Gude said a study prepared by the President's Materials Policy Commission indicated that in 1975 the total annual output of castings would be around 26,500,000 tons, as compared to 17,500,000 tons in 1953. Mr. Gude remarked that whether or not the industry would reach that goal depended on how well it met the challenge of other methods of fabrication. In conclusion Mr. Gude stated that the immediate future of foundry operations appeared good.

John B. Caine, Cincinnati, spoke on "Risering of Steel and Malleable Iron for Magnaflux Inspection." Such inspection reveals presence of invisible, very fine, hairlike cracks only revealed on machining. They apparently are hot tears or internal ruptures about 0.001-in. wide, up to 3 in. long and 1 to 1½ in. deep. Elimination of such defects in certain types of castings requires considerable study. Mr. Caine indicated that the usual practice for obtaining directional solidification by designing the gating system to obtain the maximum hot spot might be a contributing factor since hot tearing occurs at as little as 25° below solidification temperature. Risers should be only large enough to feed efficiently.

Discussing risering for gray iron, Harry Kessler, Sorbo-Mat Process Engineers, St. Louis, stated that risering should be considered on the basis of the type of iron being used since the high-carbon-equivalent, low-strength irons had considerably less liquid shrinkage than the low-carbon-equivalent, high-strength irons. In most castings he prefers side risers with a bob or extension below the parting line. In some cases, it is better to attach the riser to the casting with two openings some distance apart rather than with a single mouth. He suggested gating tangentially into the riser wherever possible to obtain best feeding.

At a luncheon with Dean Brown presiding, James Smith, Central Foundry Division, General Motors Corp., Saginaw, Mich., spoke on "Future of Castings in the Automobile Industry." He pointed out that the industry is bound to expand with a healthy national economy and that at no time have conditions been more promising than today.

To take advantage of the situation, however, the foundry industry must have products for the buyers. Castings are preferred to parts made by other methods of fabrication provided they possess the desired properties and are economical. Hence, the foundryman must apply all knowledge of technical and production methods to meet those demands.

Carl B. Stone, Lynchburg Foundry Co., Lynchburg, Va., explained that gating practice for gray and nodular iron depends largely on whether the casting is to be machined all over or used with an as-cast surface since with the latter a little more chance can be taken. He then described briefly a study made in his foundry to ascertain why some yields of good castings were much better than others. It indicated that gating system and pouring rate made the difference. Formulas and graphs were developed to provide the most suitable gating system and pouring rate to secure the highest yield of good castings from any pattern.

Mr. Stone discussed the various formulas and graphs to determine sprue size, choke area, effective sprue height and pouring time for various castings. He said that each casting

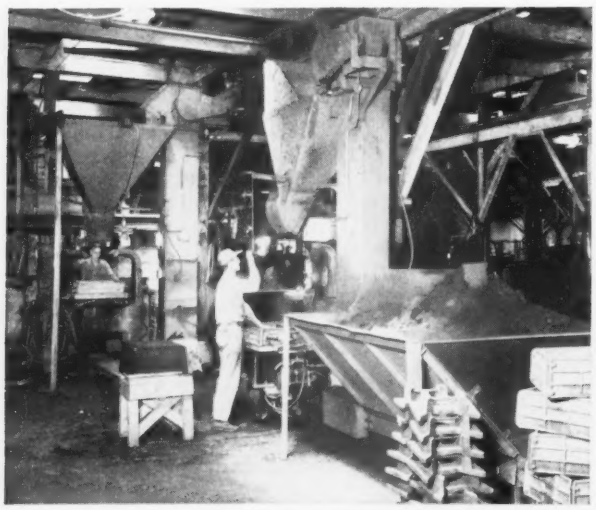
(*Concluded on page* 132)

Members of the student chapter discussed three cast metal research projects being conducted at the University of Michigan. Part of the audience is shown here

NEWAYGO sand handling eq

Fast growing West Coast foundry ind uses Newaygo sand handling equipment to increase pro and produce better castings . .

Four HANDY SANDY Units at the H. C. Macaulay Foundry Company have increased casting production more than 25%



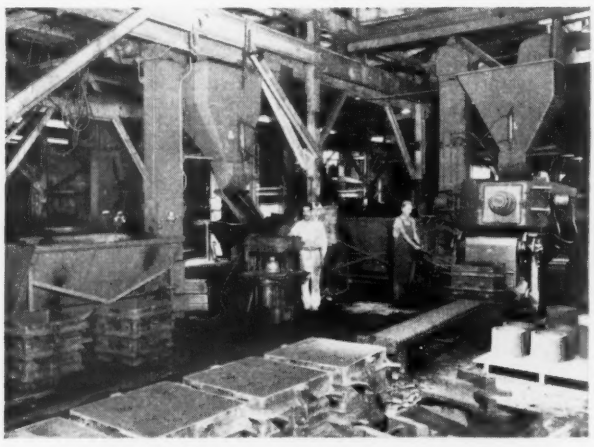
These are the original HANDY SANDYS installed in the Macaulay Foundry almost three years. "Our experience with this unit and the new unit—four machines in all—has been very gratifying. We do not hesitate in commending their performance."

Mr. Earl Paltenghi, Vice-President and General Manager of this pioneer West Coast foundry says, "As a gray iron jobbing shop, now in our 58th year, we have been operating until quite recently with a minimum of sand handling and conditioning machinery.

"However, our first two HANDY SANDY units were installed in July, 1950, and since then the daily production of both automotive and other type castings have improved considerably — and with a better casting appearance than previous methods gave us.

"We attribute the very satisfactory production increase to the fact that our molders no longer exhaust their energy shoveling sand — and also to the simplicity of movements now possible in preparing the molds.

"Improved casting appearance is unquestionably due to effectiveness of the Newaygo Aeration Unit built into each HANDY SANDY at the top of the sand elevator."

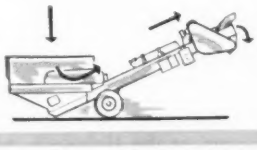


Mr. Leroy Kalin, Superintendent of the H. C. Macaulay Foundry Company states, "We recently installed these two additional HANDY SANDYS and are likewise pleased with their versatile performance. On this set-up solid steel flasks are used, mostly 30" x 30" with 8" drags and 10" copes. A wide variety of work is done on this set-up. . ."We can frankly say that our casting production with these units has increased better than 25%."

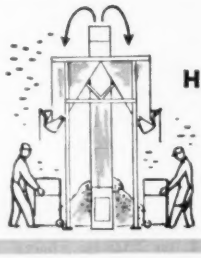
HANDY SANDY

puts sand overhead, eliminating shoveling for the molder.

REDDY SANDY



takes the hard work out of shakeout and sand preparation.



SUPER HANDY SAND

a high capacity individual-floor sand handling unit.

...equipment ...industry ...production ...

at work in BERKELEY CALIFORNIA

At the Berkeley Brass Foundry Co. Handy Sandys work over two years of continuous operation without shutdown for repairs

Mr. Bill Burt, Foundry Superintendent at Berkeley Brass tells us, "Immediately after installing Newaygo HANDY SANDYS our foundry showed an increase of over 30% in casting production. We are making larger than average molds and find that HANDY SANDYS give us substantial savings in shoveling time alone. Molds are 24" x 24" with 8" copes and 8" drags.

"Needless to say we are also very pleased with the performance of our HANDY SANDYS due to the fact that in two years of continuous operation they have not had a breakdown of any sort or have any parts been replaced. This helps make our foundry a dependable source of uninterrupted production.

"At present we are planning on the addition of another Newaygo HANDY SANDY unit."

Showing the neat, compact molding set-up afforded by the efficient twin hopper HANDY SANDY unit. Sand is fed overhead to each station from a central hopper. Additional aeration is given to sand at the top of the unit. Mr. Burt credits this extra aeration for better casting appearance.

RUSSO FOUNDRY EQUIPMENT CO.
3882 Fairway Ave., Oakland 5, Calif.
Lockhaven 8-1303 or 8-1361

Exclusive West Coast Sales and Service Engineers covering the entire states of Arizona — California — Idaho — Montana — Nevada — Oregon — Washington and Utah. Also Alberta — British Columbia and Saskatchewan in Canada.

A copy of "Planned Mechanization for Foundries" is yours for the asking. Write, wire, or phone today.

NEWAYGO | engineering company
NEWAYGO, MICHIGAN

Manufacturers of Neway® Mold Handling, Sand Handling and Conditioning Equipment

(*Concluded from page* 129)

has an optimum pouring time. If pouring rate is too slow, there is a tendency to misruns; if it is too fast, inclusions enter the castings. Although pouring times may vary from foundry to foundry, he found the following to function successfully: Time in seconds for ¼-in. section castings is equal to $1.4/\overline{W}$; for ⅜ to ¾-in. sections $1.8/\overline{W}$; for 1-in. sections $2.0/\overline{W}$; and for 1 to 1½-in. sections $3.0/\overline{W}$, where W is the weight of the casting.

Use Elaborate System

H. E. Elliott, Dow Chemical Co., Bay City, Mich., stated that in gating magnesium alloy castings, the systems must be elaborate due to oxidizing and drossing tendencies, low heat content and short liquidity time. General practice is to gate into the riser. Since it is difficult to eliminate turbulence, some is allowed in the sprue system and counteracted by screens in a reservoir at the bottom of the sprue. Castings always are gated at the lowest point to provide smooth flow. In certain types of high castings, slotted, screened gates function well, with the molten metal feeding across the top section of the gate into the casting.

With reference to gating aluminum alloy castings, Harry Hillstrom, Aluminum Co. of America, Cleveland, said that the various alloys had high thermal conductivity as well as high solidus, with the result that low thermal gradients are established during solidification of castings. Hence the gating system has to be designed to get the metal into the casting and, after it is in position, to establish directional solidification. In determining a suitable gating system, it is wise to make some pilot castings, study them carefully and make changes to eliminate trouble. Basically, according to Mr. Hillstrom, the method is to determine the size and location of chills and risers and then design the gates so that the whole system functions together.

Lawrence Watson, Wagner Malleable Iron Co., Decatur, Ill., said the practice of his firm is to examine drawings and patterns sent in by customers as to suitability for producing castings and to endeavor to obtain alterations where required. Gating then is determined by experiment. As far as his firm's practice of gating was concerned, the following were advocated: Circular gates to obtain best volume-area relationship, feeders placed as closely to the casting as possible, use of live feeders where possible, use of strainer cores and employment of an offset sprue with the strainer core in the runner.

At the dinner Harry Kessler acted as toastmaster and introduced Bruce Simpson, National Engineering Co., Chicago, national vice president of AFS, who spoke briefly on activities of the society. He was followed by Fred J. Walls, International Nickel Co. Inc., Detroit, who urged that more effort be made to stimulate the talent and curiosity of youth toward education and that engineers be given broader training.

At Friday morning's session, John VanHaver, Sealed Power Corp., Muskegon, Mich., described briefly his experiences with pressure molding in green sand. The sand had a grain fineness of about 115 and was mixed with 1½ per cent plastic material, 2½ per cent bentonite and 1½ to 2 per cent moisture. Material is used in producing thin-section piston rings made singly, and excellent results were obtained on dimensional tolerances. Pressure used on the sand is 120 psi. Stack or multiple molding is employed, and through use of the plastic bonded sand and high pressure, height of flasks was reduced from about 2 to ½ in.

Shell Molding Process

Harold Sieggreen, Saginaw Malleable Plant, General Motors Corp., Saginaw, Mich., talked on shell molding and showed a short sound film on the subject. Horizontal pouring is used in his foundry. Sand employed is Juniata bank of 95 to 105 AFS fineness to which 5 to 7 per cent dry resin and ½ per cent liquid are added —the latter as a dust suppressor. Material is mixed in a muller for 4 to 7 minutes, depending upon atmospheric humidity. Mr. Sieggreen said that shell molding, like other molding, requires attention in establishing gating and risering practice. He stated that improvements in resins, machines and knowledge are increasing application of shell molding.

Permanent molding was the subject of H. McClelland, Eaton Mfg. Co., Vassar, Mich. Castings and molds are made of the same iron, which contains 3.45 to 3.65 per cent TC, 2.40 to 2.65 per cent Si, 0.40 to 0.60 per cent Mn and 0.25 per cent maximum P. Molds are box form with pins or studs on the back to provide a large heat radiating area. At Vassar the molds are mounted on huge rotating tables which automatically open and close the molds at definite points or stations in the circuit. At those points, operators remove castings, clean molds with an airblast, smoke them with an acetylene flame and fill them with molten metal. Prior to use, mold faces are given a thin coating of refractory clay which with the smoking lasts a long time. Molds give from 400 to 12,000 or more pourings, depending on weight and contour of casting cavities.

Members of the student chapter of the University of Michigan surprised those attending the conference by acting as hosts at a buffet luncheon which they prepared and served in the Foundry Department. A spokesman for the students said that this gesture was a small token of their appreciation for assistance, advice and co-operation given by the several Michigan chapters of AFS to the student chapter.

Following the luncheon, three students presented discussions on cast metal research projects conducted at the university. P. K. Trojan described "The Microbend Test—a New Tool for Evaluating Cast Metal Structures." Small polished specimens 1/16 x 1/16 x 1 in. are mounted in a holder and placed on the stage of a microscope. Holders are arranged so that when the load is applied, specimens may be examined at either the 1/16 or 1-in. sections. The speaker showed a number of micrographs illustrating the effect of bending on gray iron and nodular iron structures.

Floyd R. Smith discussed "Dimensional Accuracy and Surface Quality in Shell Molded Castings." Molds were made with 4 to 12 per cent resin content and gray iron castings made in them. Dimensional measurements indicated that there was little variation in the tolerances between the different resin-content mixes. Surface smoothness, as measured by the Rodi instrument, showed slight differences.

Heat in Lead Bath

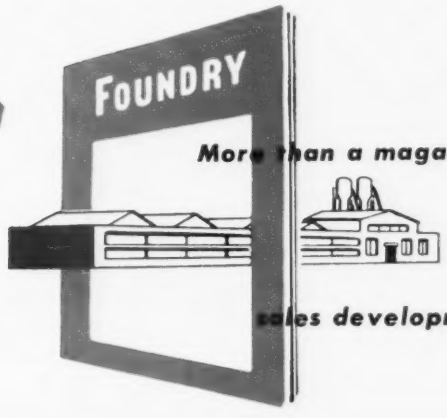
C. R. Hammond spoke on "Graphitization in Magnesium Treated Ferrous Materials." Three irons of different compositions, cast into step bars with ⅛ to 1 in. sections, were heat treated in lead baths at different temperatures and for varying periods of time. Study indicated that increase in temperature decreased the time required for graphitization; time required to transform all carbon to the spheroidal form was high, and for heavy sections it was much longer than for thin sections. The speaker also pointed out that use of lead baths for heat treatment minimized decarburization.

Conference concluded with an address by Edward J. Walsh, Foundry Educational Foundation, Cleveland, on "Careers in the Casting Industry" in which he described the function and activities of the foundation in co-operating with industry, colleges and students to bring about better understanding and greater interest.

Foundry's PLUS 5 SERVICE

will help give your sales a boost wherever metals are cast

What is PLUS 5? It's your key to more business from foundries. It gives every FOUNDRY advertiser a bonus he can get from no other source. Here is help in analyzing this market—studying sales territories and potentials—planning the sales effort—and creating a constructive promotion program to the 5 billion dollar foundry market. It's time to take a new look at this market—and at the unusual selling aids we have for you. Say PLUS 5 to your FOUNDRY representative and he'll show you this 5-step program designed to move more of your products into foundries.



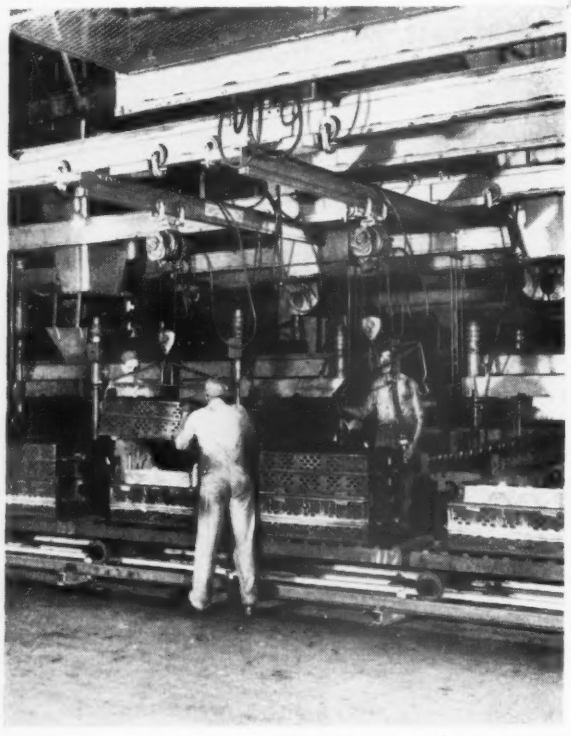
FOUNDRY • Penton Bldg. • Cleveland 13, Ohio

USE MONORAIL CRANES

. . . Where Space is Limited

. . . To Handle Variable Jobs

. . . For Low Maintenance Cost



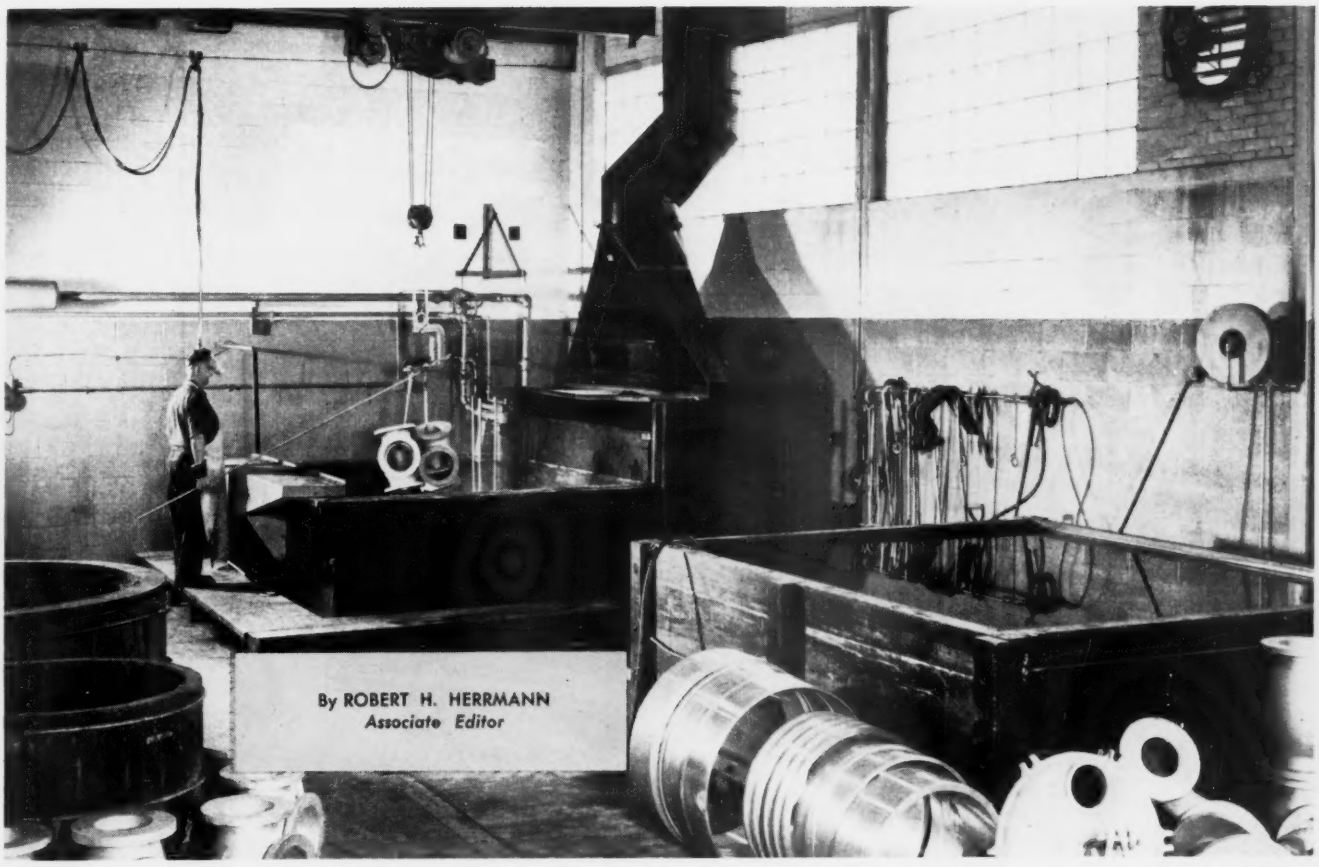
These are just a few reasons why American MonoRail Cranes are gaining in popularity and are being installed in increasing numbers of plants the country over. Call in your American MonoRail representative and have him tell you all the advantages of MonoRail Cranes such as—ease of handling—smooth travel—strength—safety interlocks—power operation and **interlocking carrier service between and beyond the craneways.** Consultation in connection with any handling problem is available without obligation.

Send for your copy of C-1 Bulletin

AMERICAN OVERHEAD HANDLING EQUIPMENT

MONORAIL COMPANY

13104 ATHENS AVENUE • CLEVELAND 7, OHIO



By ROBERT H. HERRMANN
Associate Editor

Above—Cleaning room view shows heated acid tank at rear, large rinse tank at right. Small castings are pickled and rinsed in the round tanks at left
Left—Fork lift truck moves castings between foundry and pickling buildings

Castings Pickled in Half the Time

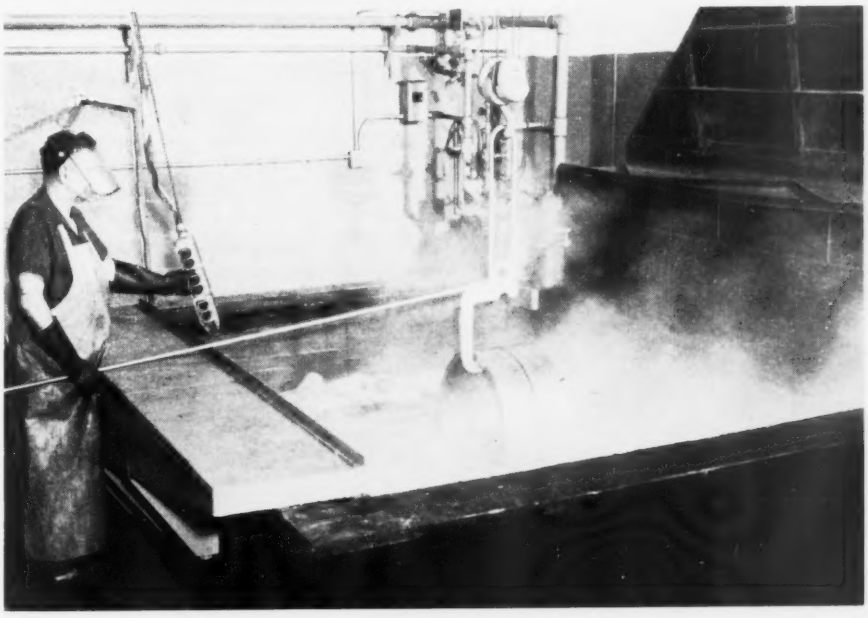
LEBANON Steel Foundry, Lebanon, Pa., recently completed a new building equipped solely for pickling and passivating steel castings. The new installation halves the previously required time for pickling, with consequent increased productivity. One man can handle the complete operation in shorter time than two as required by the old installation.

The facility is considered as another quality control tool, enabling Lebanon to offer better castings to customers. Included, however, among the reasons for making the investment is the steadily increasing demand from customers for cleaner castings and for neutral casting surfaces achieved by the passivating action of the bath. Castings supplied for machinery in the food, beverage, textile and chemical industries, must be free of oxide, scale, sand inclusions, adhering shot or grit and other foreign matter, and have completely neutral surfaces to avoid the possibility of electrolytic action.

Combined pickling and passivation of stainless steel castings is achieved in a bath composed of:

694 gal nitric acid, 68% strength
38 gal hydrofluoric acid, 60% strength

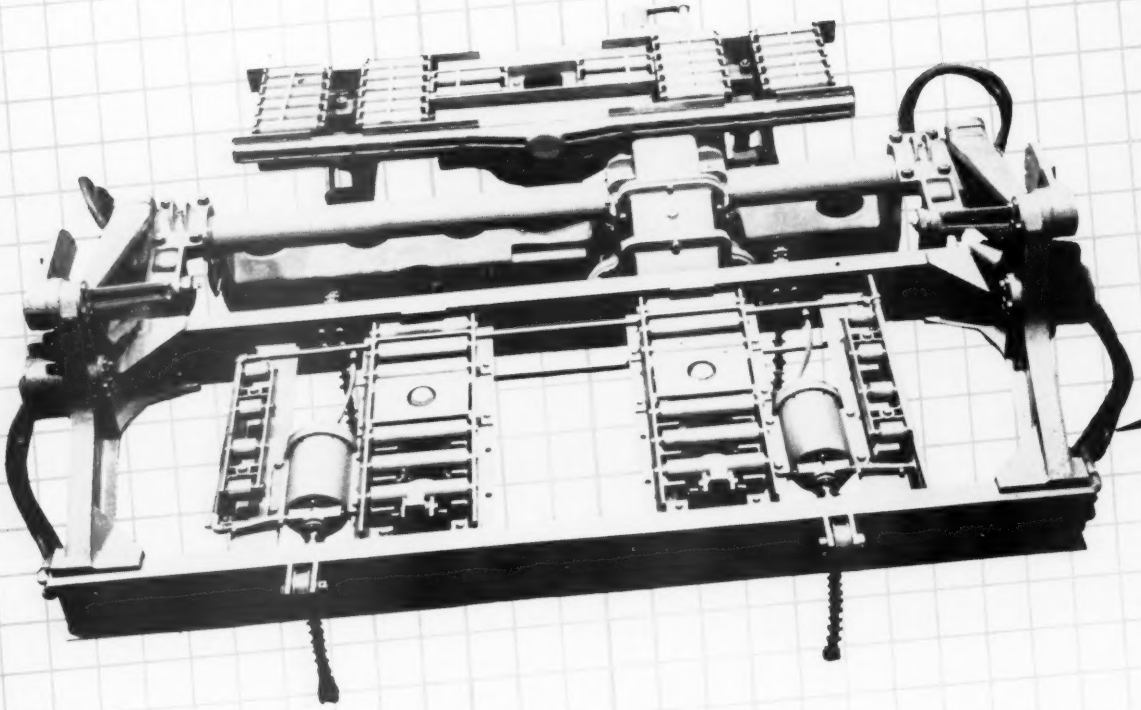
(*Concluded on page* 138)



Good ventilation, ample light and pushbutton handling of castings treated in the acid bath permit the operator to keep close control of the operation

HERMAN

Charging Conveyor Machine



IDEAL
for short-run work

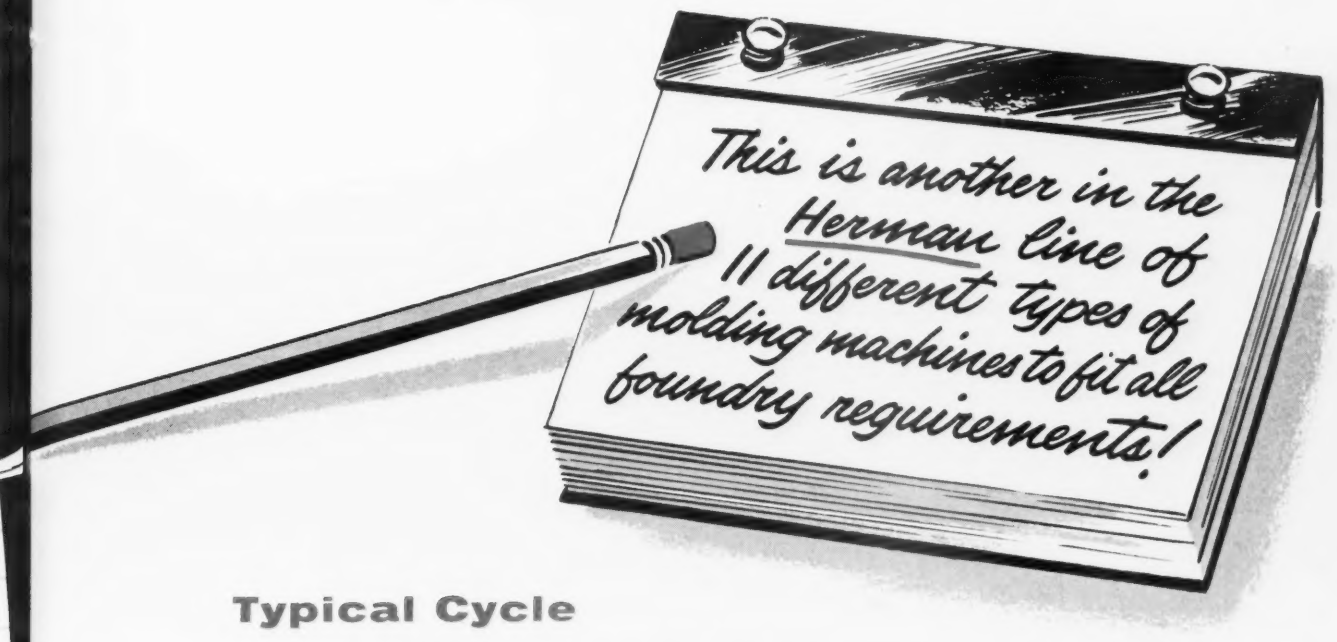
HERMAN PNEUMATIC MACHINE CO., UNION BANK BUILDING, PITTSBURGH 22, PA.

If your type of work calls for short runs, the Herman Charging Conveyor Rollover and Draw Machine is the modern, economical answer.

Its extreme flexibility, *on either cores or molds,* makes it possible to produce a tremendous range of sizes and types of work.

This comparatively new machine in the HERMAN line is already being widely used in the foundry industry. Foundrymen choose it because it's versatile and operates equally well with either a Jolt Machine or Sandslinger.

It is produced in our broad range from 500 to 20,000 lb. rollover capacities.



Typical Cycle

1. Core box filled with sand and placed on the jolt unit.
2. Power lift conveyor lowers box on sub-plate.
3. Core box is jarred and elevated by power lift conveyor to standard conveyor level.
4. Box goes to Charging Conveyor Rollover and Draw Machine, manually or by pusher mechanism.
5. Pneumatic core box and core plate clamps engage rammed core box for rollover operation.
6. After rollover, core clamps are disengaged and slow draw operation starts.
7. Vibrators separate bond between core box and sand.
8. Fast draw operation checked by speed control device and core box gently deposited directly on discharge conveyor and rolled away on companion conveyor.
9. Inverted turnover plate and core box rolled back to upright position, pneumatic clamps disengaged and box returned to either jolt station or storage.
10. Another rammed core box should, of course, now be at the Charging Conveyor Rollover and Draw Machine for the production of another core.

Why don't you get in touch with us right now for more information. Write for our catalog No. GC-11-53.

HERMAN

Best Known Name in Molding Machines

(*Concluded from page* 135)

27 gal hydrochloric acid, 30% strength
1400 gal water plus 0.10 to 0.25% wetting agent to help penetration of the acid into casting surface contaminants.

The acid is contained in an open top tank 8 x 10 x 5 ft deep. It is made of ¼-in. steel plate covered on the inside by polyvinyl chloride. Over this is a lining of carbon brick with a carbon compound coating. At the bottom of the tank, spaced in a regular pattern, are 7-in. high piers on which rest stainless steel grids to hold castings being treated.

Speed of the cleaning action is obtained by the use of a submerged, gas-fired burner for heating and agitating the acid solution. Burner unit consists of an L-shaped carbon tube 6-in. in diameter. One leg of the L rests on the tank bottom along one side; the other extends vertically out of the bath. Air and gas at 5 psi are piped separately to the burner head in the vertical leg of the combustion tube. When the burner is started, compressed air enters the combustion tube first to overcome the head of liquid in the tank. After the tube has been purged of solution, a pilot flame is ignited. Subsequently the main gas flow starts and is ignited by the pilot flame. The air-gas ratio is controlled automatically to give maximum combustion efficiency.

Products of combustion leave the horizontal section of the combustion tube through a series of holes, thus heating the solution by direct contact and setting up currents which agitate the bath. Temperature of the solution is controlled automatically at 120° F. Operation of the entire unit is controlled by start and stop pushbuttons.

Fumes are removed from the surface of the bath through an exhaust hood of 9500 cfm capacity located along one side of the tank. Hood and piping are made of polyvinyl chloride and fan blades are stainless steel. Fresh air is supplied at the rate of 5300 cfm along the opposite edge of the tank through a section of slotted duct.

Castings are rinsed in water containing a wetting agent at room temperature in an 8 x 10 x 3 ft-deep wooden tank adjacent to the acid tank.

Pickling of carbon and low alloy steel castings when requested by the customer is done in a 400-gallon acid bath which is made up as follows:

48 gal hydrochloric acid, 30% strength
32 gal sulphuric acid, technical grade
7 qt hydrofluoric acid, 60% strength

Balance — water

This is a room temperature solution contained in a tank 6 ft in diam and 3 ft deep. The tank is made of two layers of wood with ¼-in. neoprene rubber between the layers. Entire tank is coated with neoprene paint. Rinsing is done in water with 0.40-per cent wetting agent added. The all-wood rinse tank is about the same size as the pickling tank.

The pickling building is a 28 x 60 x 20-ft high brick faced structure lined with cinder block, with a cement roof. Interior walls and ceiling are coated with an acid-resistant paint. The floor consists of hardened brick laid on a cement slab. Mortar between the bricks is a carbon-base, acid-resistant compound. The room is well lighted with large windows in the upper portion of two walls.

A 2-ton floor operated bridge crane spans the room and is used for moving castings into and out of the baths. Large castings are handled individually by hooks, small castings being loaded into perforated metal trays equipped with rigid bails. A fork lift truck brings castings to the building from the foundry and carries them away for inspection prior to shipment. The pickling building is separate from other foundry buildings.

General room ventilation is achieved by an exhaust fan mounted high on an outside wall. Air enters the room through a large door which may be left open in fair weather or through the fresh air intake on a 1-million Btu oil-fired space heater which heats the room during winter.

A central control panel at one end of the room contains electrical switches for operating the motorized lift door, space heater, room exhaust fan, tank ventilation equipment and lights. Switches for the air and gas compressors and the acid bath heater are located adjacent to that equipment.

HISTORIC LANDMARK: The Saugus Ironworks Restoration (above) was formally dedicated in September as a complete and authentic replica of the first successful and sustained producer of cast and wrought iron in the New World. Operating from about 1646 to 1670, the plant produced bar and rod iron, pots, skillets and other iron products. The integrated iron works was a prototype of American industry in general and it was, perhaps, the first foundry in the country. America's iron and steel industry has reconstructed this industrial landmark, 10 miles north of Boston, at a cost of over $1.5 million to dramatize the historical and educational significance of the foresighted efforts of these early pioneers

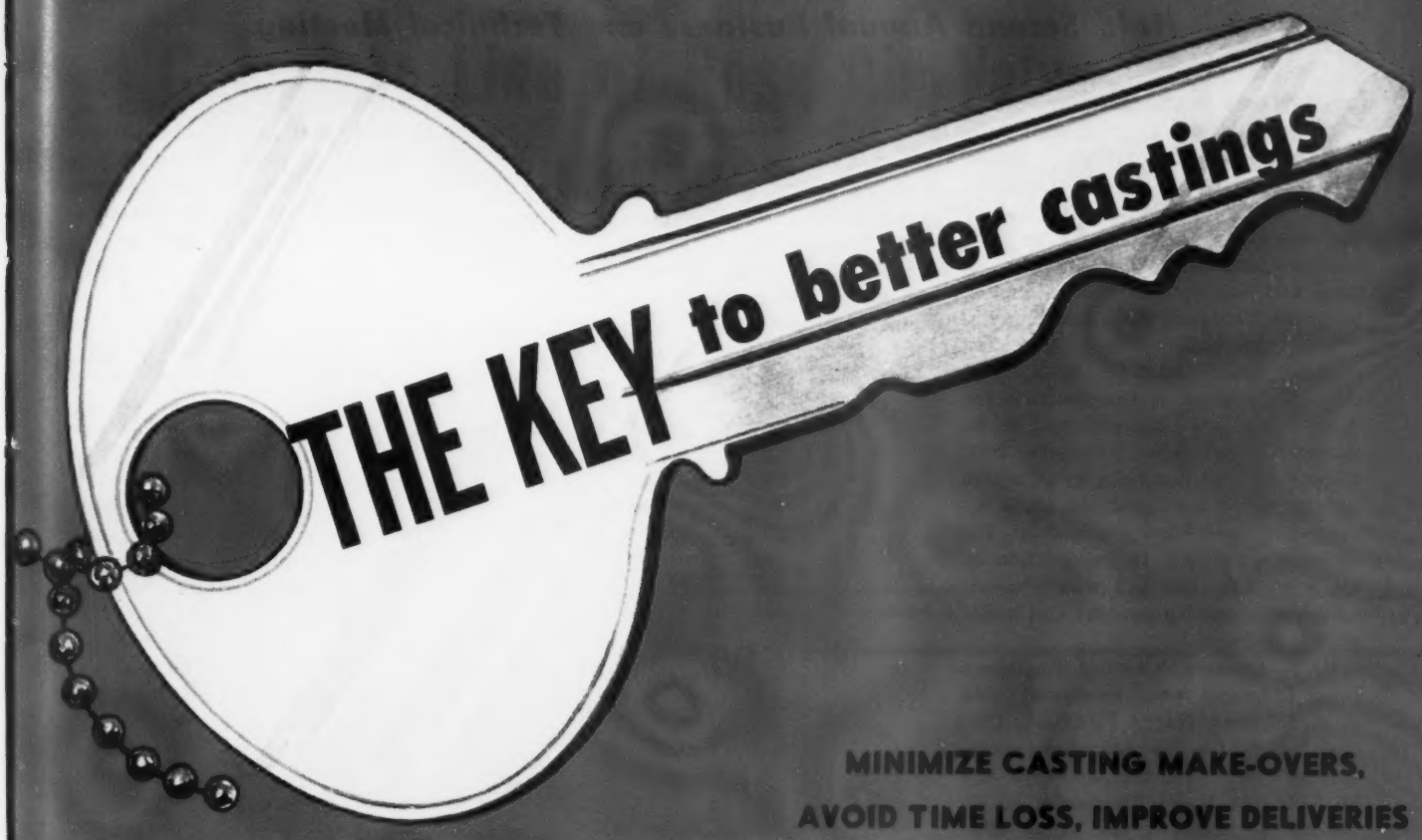
Steel Council Publishes Manual on Painting

A practical manual on painting, the first of two volumes, has been published by the Steel Structures Painting Council, 4400 Fifth Ave., Pittsburgh 13. Entitled "Good Painting Practice," the volume has been prepared by a staff of specialists and edited by Dr. Joseph Bigos, director of research of the council.

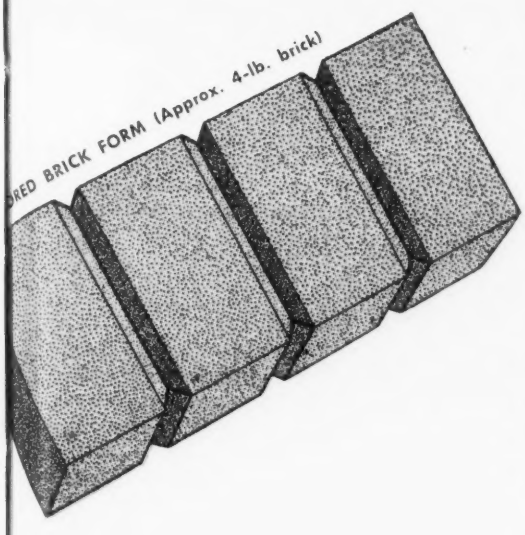
The volume describes current surface preparation and painting practices in various industries and is written from the standpoint of the paint user. The book is an encyclopedia of economical and satisfactory painting methods, rather than a technical treatise on paint formation.

The book contains 432 pages, 8½ x 11 in., and may be ordered from the council for $6, postage paid.

Famous CORNELL CUPOLA FLUX



MINIMIZE CASTING MAKE-OVERS, AVOID TIME LOSS, IMPROVE DELIVERIES



Famous Cornell Cupola Flux does a thorough job of separating foreign matter from molten iron—and makes metal hotter and more fluid.

Where Famous Cornell Cupola Flux is used, there is amazing freedom from chilled sides, hollow centers and hard spots in castings—machining is much easier and smoother.

Famous Cornell Cupola Flux costs but little to buy, and takes practically no labor to use due to its Pre-Measured SCORED BRICK FORM. You simply lift it out of the container and toss it into cupola with each ton charge of iron, or break off one to three briquettes (quarter sections) for smaller charges, as per instructions.

Very little labor is required for digging out, as bridging over is practically eliminated and drops are cleaner. Furthermore, there is less erosion of cupola lining due to a glazed or vitrified protective surface which is formed on brick or stone—less repairing.

WRITE FOR BULLETIN NO. 46-B

The Cleveland Flux Co.

1026-1040 MAIN AVENUE, N. W., CLEVELAND 13, OHIO

Manufacturers of Iron, Semi-Steel, Malleable, Brass, Bronze, Aluminum and Ladle Fluxes - Since 1918

FAMOUS CORNELL FLUXES
Trade Mark Registered

BRASS FLUX

FAMOUS CORNELL BRASS FLUX cleanses molten brass even when the dirtiest brass turnings or sweepings are used. You pour clean, strong castings which withstand high pressure tests and take a beautiful finish. The use of this flux saves considerable tin and other metals, and keeps crucible and furnace linings cleaner, adds to lining life and reduces maintenance.

ALUMINUM FLUX

FAMOUS CORNELL ALUMINUM FLUX cleanses molten aluminum so that you pour clean, tough castings. No spongy or porous spots even when more scrap is used. Thinner yet stronger sections can be poured. Castings take a higher polish. Exclusive formula reduces obnoxious gases, improves working conditions. Dross contains no metal after this flux is used.

PRODUCERS OF INVESTMENT CASTINGS

Hold Second Annual Business and Technical Meeting

By WILLIAM G. GUDE
Managing Editor

SECOND annual meeting of the Investment Casting Institute attracted more than 80 industry representatives to the Congress Hotel, Chicago, Nov. 3-4. First of the two days was devoted to business sessions of the institute's directors and committees. A technical program occupied the second day.

Ted Operhall, Misco Precision Casting Co., Whitehall, Mich., was elected president of the institute for the coming year. He succeeds K. M. Bartlett, Thompson Products Inc., Cleveland, who has been most active in affairs of the institute since its inception, and who presided at the Chicago meeting. In recognition of his work Mr. Bartlett was presented a testimonial plaque at the meeting's conclusion.

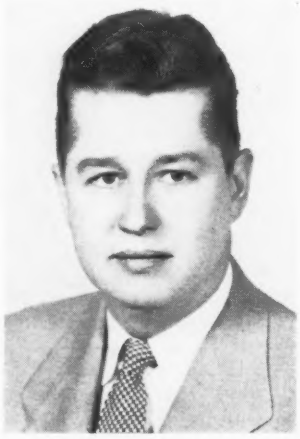
V. S. Lazzara, Casting Engineers Inc., Chicago, was re-elected vice president, and Harry P. Dolan, Chicago, continues as executive secretary. Newly elected directors are Mr. Bartlett, K. W. Thompson, K. W. Thompson Tool Co., and A. C. Williams, Crucible Steel Co. of America.

Dr. Nicholas J. Grant, Massachusetts Institute of Technology, was chairman of the technical sessions. The first paper, "Theory and Practice of Degassing Metals," was presented by Manley W. Mallett, Battelle Memorial Institute. He discussed means of eliminating various gases from liquid metals by additions to the melt, and from solid metals by vacuum heat treatment; also methods of determining gas content of metals.

Results of a study of investment materials were discussed by H. O. McIntire, Battelle Memorial Institute. He stressed the importance of good packing of backing material in the flask, and mentioned that maximum density is obtained by a combination of fine and coarse grains. Slow packing of a thick slurry appears to give greater mold strength than rapid packing of a thin slurry. Investment materials vary in their expansion rates, he pointed out. Quartz, for instance has a maximum expansion of 1.4 per cent at 1063°F. Fused silica expands less than 0.1 per cent at 1800°.

Care should be exercised to prevent migration of salts of the investment binder from extending to the mold surface and causing a rough casting finish. This can result under certain conditions of heating and storage.

The investment caster faces problems in producing test bars which are representative of the properties of the casting, it was stated by Dr. Grant. When test bars are cast separately, their position in the mold affects their cooling rate and resulting physical properties materially. Consequently, the producer must experiment to find the best type of bar and its location to give the information desired.



TED OPERHALL
ICI President

Studies to determine the flow characteristics of liquids entering transparent molds were described by Douglas McCullough, General Motors Research Corp. In this work plastic molds were poured with water and photographed with high-speed film. Molds for both test bars and turbine buckets were studied; in both cases bottom gating was employed. In the case of the buckets, turbulence and entrapment of air in the molds was eliminated when side runners leading to the mold cavities were changed from an angle of 90 degrees to the main runner to 45 degrees.

Recent work of the institute's Materials Specifications Committee was reported on by its chairman, Charles Yaker, Misco Precision Casting Co. A number of specifications covering investment castings already have been adopted by the Society of Automotive Engineers, and it is hoped that these can be expanded to include additional metal compositions. The committee plans to submit proposed specifications to the Air Materials Specification Committee of SAE after a study by casting producers and consumers. Roger Waindle, Wai-Met Engineering Co., Muskegon, Mich., explained the procedure for securing adoption of AMS specifications and discussed some recent revisions in specifications.

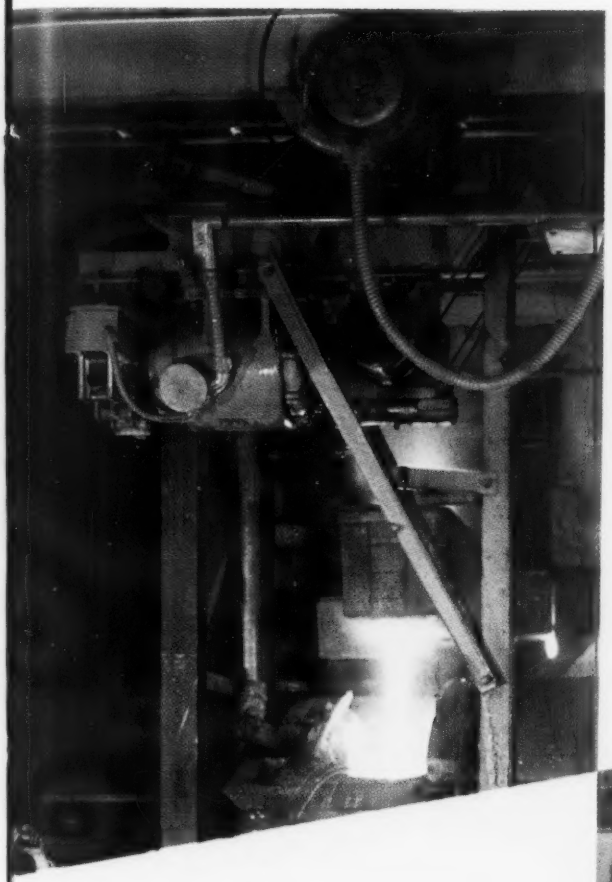
Speaking on this same subject, Dr. James Freeman, University of Michigan, said that certain applications for castings would be protected by tightening of specifications. He added that alloys of chrome-nickel-cobalt plus titanium-aluminum additions seem to be the principal metal for high-temperature, high-stress applications, and that castings will face strong competition from forgings for such business.

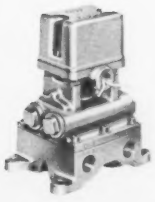
The investment casting industry was hurt by claims years ago that unrealistic dimensional and finish tolerances could be met on production runs. This was pointed out by E. G. Chapman, Misco Precision Casting Co., in discussing factors related to dimensional control. These factors, all of which affect dimensions of the casting, include the wax or other pattern material, die, clamping pressure, temperature, gate location, stability of the mold and cleaning operations. The speaker suggested the following as desirable tolerances for the casting producer to maintain on production work: under ¼-in. section, ±0.003-in.; ¼ to ½-in., ±0.004-in.; ½ to 1 in., ±0.005; each additional 1 in., ±0.005-in.

B. W. Duncan, Alloy Precision Castings Co., Cleveland, and chairman, Inspection and Standard Quality Practices Committee, spoke on standard test procedures for the industry. These include such tests as tensile, rupture, and x-ray and other forms of nondestructive testing. It was recommended that ASTM tests be adopted where applicable.

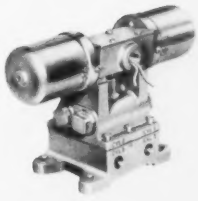
The institute voted the election of four honorary members. They are: Walter Sulzer, Gebruder Sulzer AG, Winterthur, Switzerland; Frank Nixon, Rolls-Royce of England; Dr. James Freeman, University of Michigan, and Dr. Nicholas J. Grant, Massachusetts Institute of Technology.

Complete Line of Ross Air Valves for Simpler Maintenance . . . Less Cost

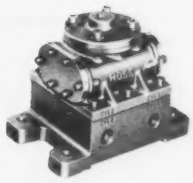




Dustproof single solenoid valve.
3-way or 4-way. Base mounted.

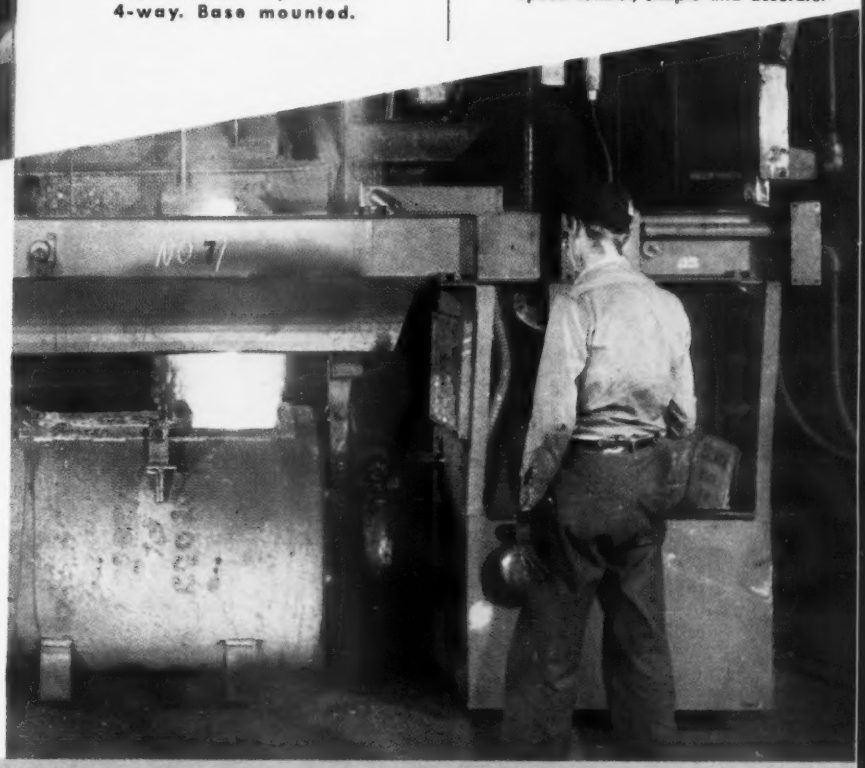


Dustproof momentary solenoid valve.
3-way or 4-way. Base mounted.



Retrold (Pressure operated).
4-way. Base mounted.

Speed control, simple and accurate.



Prompt, Expert Engineering Service—Around the World

Thousands of Standard Types in 1/8" to 2" Pipe Sizes

Ask Your Nearby Ross Representative to Acquaint You with the Complete Ross Valve Line for Foundries

ROSS Control VALVES

Ross OPERATING VALVE COMPANY

120 E. GOLDEN GATE AVENUE • DETROIT 3 • MICHIGAN

For Permanent Mold Castings

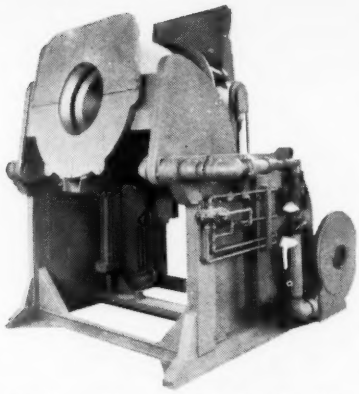
A complete line of

LINDBERG FISHER

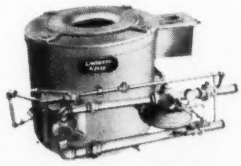
ALUMINUM MELTING and HOLDING FURNACES

Lindberg-Fisher manufactures all types of Aluminum Melting and Holding Furnaces for permanent mold application—Gas-Oil-Electric resistance.

Lindberg-Fisher engineers can intelligently recommend the type of furnace to best suit your needs and conditions.

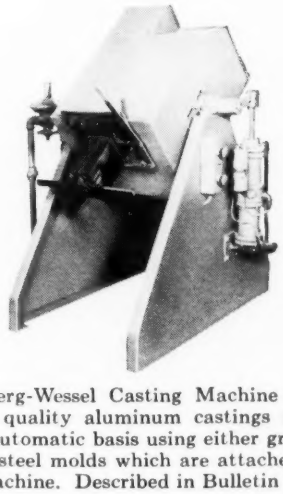


Lindberg-Fisher type HNP Hydraulic Nose-Pour Tilting Crucible Furnace. Pouring lip is located in the axis of tilting providing a constant pouring arc regardless of degree of furnace tilt. Capacities up to 1000 lbs. of aluminum. Oil or gas fired. Described in Bulletin 57-A.



Lindberg-Fisher type ADC Aluminum Melting and Holding Furnace. Capacities up to 1000 lbs. of aluminum. Oil or gas fired. Described in Bulletin 301.

Lindberg-Fisher Electric Resistance Aluminum Melting and Holding Furnace equipped with heavy duty resistance elements which give uniform distribution of heat, insuring long element and pot life. Capacities up to 1000 lbs. of aluminum.



Lindberg-Wessel Casting Machine produces quality aluminum castings on a semi-automatic basis using either graphite or steel molds which are attached to the machine. Described in Bulletin LW.

Melting specialists for 25 years
Sales and service offices in principal cities

LINDBERG FISHER **MELTING FURNACES**

A Division of Lindberg Engineering Company, 2453 West Hubbard Street • Chicago 12 • Illinois

OBITUARY

WALTON L. WOODY, 63, since 1943 vice president in charge of operations, National Malleable & Steel Castings Co., Cleveland, died Oct. 30. He joined the Indianapolis plant of the company in 1914, after graduation from Rose Polytechnic Institute. Later that year he was transferred to Cleveland to establish the

WALTON L. WOODY

company's first chemical laboratory, later becoming metallurgist, assistant superintendent and plant manager. During 1926 he acted as manager of the Chicago plant, but returned to Cleveland that same year and remained until 1938 when he became plant manager at Sharon, Pa., and directed expansion programs there and at the Melrose Park, Ill., plant. He became assistant to the president in 1943, in charge of the Sharon and Melrose Park plants, and later that year was named vice president in charge of operations.

Mr. Woody was first president of the Northeastern Ohio Chapter of the AFS, served as a director of the national organization for 3 years and was AFS president in 1950-51.

* * *

Henry Chamberlain, until his retirement in 1946, chairman of the board of directors, Los Angeles Steel Castings Co., Los Angeles, died Oct. 9. Mr. Chamberlain was also board chairman of Los Angeles By-Products Co., and the Chamberlain Co., founded by his father.

* * *

Erwin H. Baetke, 56, president, Kilbourn Pattern Co., Milwaukee, died Oct. 9. He had been president of the company since 1927. Mr. Baetke was a former president of the Wisconsin Patternmaker's Association.

* * *

Paul F. Rice, 63, chairman of the board, Milwaukee Chaplet & Mfg. Co., Milwaukee, which he founded in 1920, and also president, Milwaukee Chaplet & Supply Co., died Oct. 10. Mr. Rice was a past director of the Wisconsin Chapter of the American Foundrymen's Society.

* * *

William Adam Jr., 55, for the past year president, Ajax Electric Co., Philadelphia, died Nov. 1. A graduate of Drexel Institute in 1921, Mr. Adam was in the sales department of the former Ajax Metal Co. He was a founder of the Ajax Electric Co. in 1930.

* * *

Max S. Cohn, 65, for 49 years an executive of L. A. Cohn & Bro. Inc., Chicago refining and smelting company, died Oct. 15. He became associated with R. Lavin & Sons Inc. last year when it acquired L. A. Cohn & Bro.

Dr. Theodore Geilenkirchen, 78, for many years and until World War II, director and secretary of the German Iron Founders' Association, died suddenly Sept. 27, while attending the International Foundry Congress in Florence, Italy. Dr. Geilenkirchen was well known in this country.

* * *

Judge George W. Armstrong, founder and chairman of the board of directors, Texas Steel Co., Ft. Worth, Tex., died Oct. 1.

* * *

Eugene C. Phillips, 68, assistant general sales manager, Pettibone-Mulliken Corp., Chicago, died Oct. 9.

* * *

Herman H. Heidbreder, founder and president, Central Pattern Co., Quincy, Ill., died Oct. 9.

Earl L. Shaner, Penton Board Chairman, Dies

EARL L. SHANER, chairman of the board, Penton Publishing Co., Cleveland, publisher of FOUNDRY and other business publications, died in that city Nov. 10.

During his long career in the publishing field, Mr. Shaner had numer-

EARL L. SHANER

ous associations with the foundry industry. When he joined the Penton company he first served as editorial representative of FOUNDRY as well as of the former *Iron Trade Review.* More than 30 years ago he edited *Transactions* for the American Foundrymen's Society, and for a number of years he had been an honorary member of the AFS Alumni Group—an organization composed of present and past officers, directors, medalists and life members of the society. He was a frequent speaker before management and technical groups of the foundry and the foundry equipment industries.

Mr. Shaner was born in Olean, N. Y., in 1890 and was graduated from Purdue University in 1914 with a degree in mechanical engineering. After spending two years with the Pennsylvania Railroad, he joined the Penton Publishing Co., where he remained until 1917. Following two years of service with the U. S. Army, he returned to Penton in 1919 as engineering editor of *Iron Trade Review* (now *Steel*). He was made managing editor in 1925 and editor in 1927. Mr. Shaner became editor-in-chief in 1937 when he was elected president and treasurer of Penton Publishing Co., and he continued in that editorial capacity up to the present. He had been chairman of the Board of Directors since 1949.

Active in business paper journalism and publishing, Mr. Shaner was a past president of the National Conference of Business Paper Editors, director of the National Publishers Association and past president of the Associated Business Papers.

Following World War II, Mr. Shaner was asked to join the United States Reparations Commission as a specialist in the iron and steel industry. In that capacity he circled the globe and visited industry in Japan, Korea, Manchuria, Formosa and Germany.

Through his fine editorials in our sister publication *Steel,* through his talks before many industrial and business groups and through his many contacts in the metalworking industry, Earl Shaner won widespread admiration and respect for his wisdom and understanding. His contributions to the Penton company, to FOUNDRY and to the broad metalworking industry have been many.

TROUBLE SHOOTING

By C. W. AMMEN

Average Brass Scrap Analyses

	Cu	Sn	Pb	Zn	Fe	Ni	Sb	Al	Other
Copper									
No. 1 copper	99.00 min	....	....	....	....	....	....	....	....
No. 2 copper	95.00 min	.5	.5	....	....	....	....	....	....
Heavy Copper	99.00	.5	.5	....	....	....	....	....	....
Light copper	92.09 min	1.00	2.00	....	....	....	....	....	....
High Grade									
Oillite bushings	90.0	10.0	....	....	....	....	....	....	....
Tinny gears	89.3	10.5	.25	bal	....	....	....	....	....
Pulp mill screen	89.0	5.0	Tr	bal	....	....	....	....	....
No. 1 high grade	88.0	7.5	.5	bal	....	....	....	....	....
No. 2 high grade	88.0	6.0	2.0	bal	....	....	....	....	....
Phos. bronze	95.0	5.0	nil		....	....	....	....	....
Brass converters	88.5	9.5	0.01	bal	....	....	....	....	....
Flanges w/copper	91.0	3.0	.77	bal	....	....	....	....	....
Trolley wheels	89.5	8.1	.7	bal	....	....	....	....	....
Bell metal	81.0	17.6	.6	bal	....	....	....	....	....
Red									
Red scrap	85.0	4.5	5.0	bal	....	....	....	....	....
Red borings	same as scrap								
Yellow									
Yellow scrap	70.0	1.0	2.0	bal	.6	....	....	....	....
Primers	61.5	.3	1.5	bal	....	....	....	....	....
Ni-plated brass tubes and reflectors	67.0	.1	.1	bal	....	....	.6	....	....
Condenser tubes, alum ⅞"	77.7	....	....	bal	....	....	....	2.5	....
Condenser tubes (Adm.)	70.0	.9	....	bal	....	....	....	....	....
Condenser tubes (Muntz)	63.00	....	0.20	bal	....	....	....	....	....
Yellow faucets	70.00	....	....	bal	....	....	....	....	....
Rod Stock	62.00	....	2.00	bal	....	....	....	....	....
Brass turbine blades	68.50	nil	nil	bal	....	....	....	....	....
Light brass	67.00	1.00	1.00	bal	0.50	....	....	....	....
Rolled brass	67.00	.1	.1	bal	....	....	....	....	....
Radiators									
Oil coolers	75.00	4.0	4.0	bal	....	....	....	....	....
Radiators with fins	82.00	2.00	5.75	bal	....	....	....	....	....
Heat exchangers	80.00	4.75	2.00	bal	....	....	....	....	....
Oil coolers-round w.o./ribbed frame	80.50	3.95	4.00	bal	....	....	....	....	....
Cores with copper tanks	73.50	4.85	17.75	bal	....	....	....	....	....
Cores with brass tanks	66.09	6.75	15.25	bal	0.40	....	....	....	....
Ford—cores and tanks	80.75	3.25	5.50	bal	....	....	....	....	....
Brass tubular	72.85	4.30	5.25	bal	0.50	....	....	....	....
Mixed radiators	68.00	5.00	12.00	bal	....	....	....	....	....
High Lead									
Sweated electro shells	60.00	1.25	37.6	....	....	....	1.20	....	....
Car boxes	75.7	5.50	17.00	bal	....	....	0.60	....	....
Lead cable ⅞"	21.2	....	78.8	....	....	....	....	....	....
Ni-Cu Alloys									
Monel clips	34.0	....	....	....	1.00	65.00	....	....	....
Cu-nickel scrap	70.00	....	....	....	....	30.00	....	....	....
Ni-silver scrap	bal	1.00	1.00	15.00	1.00	18.50	....	....	....
Miscellaneous									
Gilding metal shell rings	90.0	....	....	10.00	....	....	....	....	....
Mixed Si-Bronze	95.00	....	....	2.00	1.00	....	....	....	2.00 Si
Screen	80.0	....	....	20.0	....	....	....	....	....
Ford Gears	90.5	nil	....	....	....	....	....	10.5	....
Al-bronze	bal	....	....	....	3.0	....	....	9.0	....
Duronz	92.0	....	....	....	1.0	....	....	3.0	2.00 Si
85/15 Pipe	85.8	nil	nil	bal	....	....	....	....	....
Brass backs	71.0	20.0	6.0	1.50	....	....	1.50	....	....
No. 1 babbit or pewter	....	80.0	10.0	....	....	....	10.0	....	....
Manganese bronze	60.0	.5	.5	bal	1.0	....	....	1.0	....

Castings Made of Brass Scrap

DEAR CHARLIE:

I have run down a job requiring a large number of cheap brass castings with no specification other than that they be cheap and made of brass. Since I have priced myself out on several of these jobs in the past, I was thinking of running this one out of scrap.

The average gray iron scrap analysis is in several of my books, but nothing appears on average copper-base scrap analysis. Can you throw any light on this and on what the so-called cheap brass mixes are? A gent I know who was born and raised at a junkyard swears he can separate anything I want. His system seems to be feel, smell and bite.

SAM

DEAR SAM:

There was a time, Sam, when it was fairly easy to separate copper-base scrap by feel, smell and bite, but the large variety of alloys used today makes it hard to determine what's what any more. Scrap dealers separate into general classifications, but the chance for a mixup still exists. I don't think you should rely on scrap as a general melting stock unless you are equipped to melt, analyze, refine and make adjustments to the melt to produce the desired alloy. This procedure is the business of secondary smelters.

Alloying has been reduced to a minimum in nonferrous foundries because of the availability of a good supply of ingot metal of just about any analysis desired. Available in ingot form, which is easy to charge and handle, this metal offers high purity and certified chemical analysis and physical properties. Ingot also is available for plumbing ware and similar castings, for which cheaper semi-red, yellow, etc., can be used.

In some of these highly competitive lines, the chief aim is to use as cheap a mixture as possible. Consequently, some foundries favor scrap. End use of the castings must be considered carefully with your physical setup and metal requirements. For good results, scrap melting requires close control by a properly trained melter. Scrap presents many problems that the use of purchased ingot can eliminate. In the long run, it often costs more to melt scrap than to buy ingot.

You might melt scrap for run-of-the-mill and low-pressure work—red, semi-red and yellow castings such as plumber's brass, sweat fittings, small pump housings, impellers, ornamental work and pieces requiring no particular analysis or physical properties. I suggest that you compute charges from the scrap or scrap-ingot mixture in the same way similar gray iron charges are computed. The average brass scrap analysis given here will help you to do so.

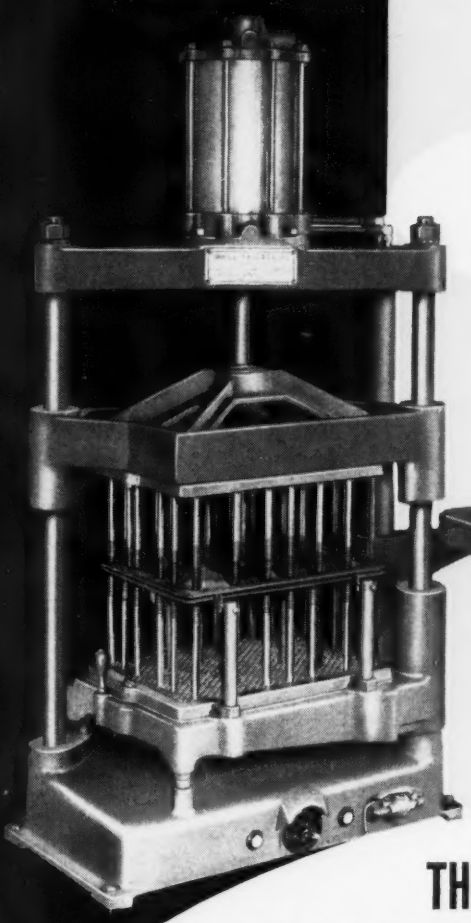
You Must Use Care—Certain precautions should be taken when scrap is melted. It should be free of oil, dirt, paint, iron, steel, aluminum and other impurities. Borings should be cleaned to remove coolants, cutting oils and greases, then run over a magnetic pulley to remove ferrous inclusions. Valves should be inspected, and any silicon or aluminum-bronze seats and trim must be removed.

Because high loss results when thin or small pieces of scrap are melted, such pieces should be briquetted to as high a density as possible. Heavy material should be melted down first. Light material such as borings, punchings and clippings is pushed under in small amounts.

Let's assume we're using a crucible to melt a scrap charge consisting of copper wire, sheet brass clippings or punchings, lead and tin. The

(*Concluded on page* 147)

PUSHBUTTON



SHELL BONDING

THE MOST EFFICIENT SHELL BONDING FIXTURE EVER DEVELOPED!

(Now reduced in price by more than 15% . . . due to popular demand)

Requires 'half' an operator . . . produces top quality shell molds . . . pressure sealing and timing completely automatic.

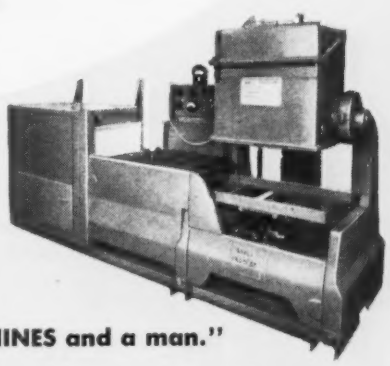
No other method of shell bonding can compare or compete with this remarkable bonding fixture. Cope and drag are joined with thermosetting resin under the overall pressure of adjusting pins. Pressure and timing are automatic.

Shell halves can be bonded faster than they are formed, and produce top quality finless castings . . . tolerances held fast at the parting line. One unskilled worker can easily operate the shell molding machine and bonder.

Immediate delivery on 15" x 20" and 20" x 30". Larger sizes available — send us your requirements for quotation.

Team up with Pushbutton Shell Molding and Shell Bonding to increase your production and profits.

SHELL PROCESS
INCORPORATED
Manufacturers of Shell Molding Machines and Allied Equipment
346 McKinstry Avenue
Chicopee, Mass.

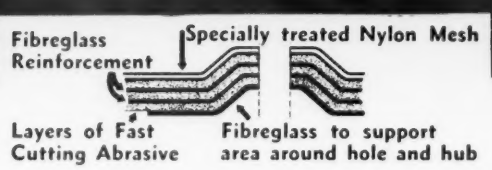


Biggest profit making team in the shell molding industry is the shell bonding fixture combined with the Shell Process molding machine. Engineered for team work, it's the highly acclaimed set-up of **"2 MACHINES and a man."**

PROGRESS for real "POWER" grinding!

NEW

SAF-T-CUT "BZ" Reinforced Disc-Wheel


Fibreglass Reinforcement
Specially treated Nylon Mesh
Layers of Fast Cutting Abrasive
Fibreglass to support area around hole and hub

Again BAY STATE progress opens new horizons in faster, safer heavy-duty portable grinding. Saf-T-Cut "BZ" disc-wheels are reinforced with multi-layer fibreglass and specially treated nylon.

Give "BZ" disc-wheels all the power you have! Run them at maximum recommended speeds! They have been "built" to withstand heavy-duty grinding . . . with long wheel life. Extensive tests on weld grinding jobs have produced record breaking results.

Get the fastest heavy-duty cutting action, the greatest disc-wheel strength, the maximum wheel life . . . *plus* a range of hardnesses from which to choose the one you need. Saf-T-Cut "BZ" is Bay State's *latest* "Wheel of Progress"!

ASK FOR A DEMONSTRATION ON YOUR WORK.

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVE PRODUCTS CO., Westboro, Mass., U. S. A.

Branch Offices and Warehouses — Chicago, Cleveland, Detroit, Pittsburgh
Distributors — All principal cities
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ont.

Manufacturers of all types of Quality Abrasive Products

(*Concluded from page* 144)

copper is melted first under a cover of charcoal, with the atmosphere on the oxidizing side. When the copper is down, add 8 oz of 15 per cent phosphor-copper per 100 lb of complete melt. Place a ring on the crucible to increase its height so that a large quantity of material can be packed in each time. When this material becomes red, it must be pushed under the molten copper. This process is repeated until the complete charge has been melted; then the tin and the lead are added.

I know of several foundries which still melt auto radiators in open-flame rotary furnaces for cheap red, semi-red and yellow brass. Composition is adjusted by addition of briquetted copper sheet and tubing and low-lead ingot. One common charge consists, by weight, of two-thirds mixed, briquetted radiators and one-third low-lead yellow ingot of the following analysis: Cu, 66.1 per cent; Pb, 0.9 per cent; Sn, 0.8 per cent; Fe, 0.3 per cent; Ni, traces; and Zn, balance.

Borings taken from castings made from such a heat showed this analysis: Cu, 72.5 per cent; Sn, 3.54 per cent; Pb, 8.5 per cent; Zn, 14.69 per cent, Ni, 0.07 per cent; Fe, 0.36 per cent; P, under 0.01 per cent; and Al, nil. This analysis was certified by a testing lab.

Some shops pig and then remelt in crucible furnaces, and others take the metal as is from the rotaries and pour off as is. Melting in rotaries should be done slightly on the oxidizing side. When the heat starts to break down, cover it with a glass/borax slag. Maintain a complete cover throughout the melt, with no surface exposed to the products of combustion. When the heat starts to flare with little pips through the slag, it usually is at about 2100° F.

Can Use Cupola—A small cupola can be used with very low blast pressure and a high-carbon, low-sulphur coke at about a 20-1 ratio to melt down scrap. Radiators melted by this method lose about 2 per cent Cu, 60 per cent Zn and 15 per cent Pb. By practice you can make a semi-red brass from briquetted radiators with tanks, or you can reduce copper scrap in the cupola and alloy in the ladle by placing the preheated additions in the bottom and pouring the copper. With this method it is desirable to pig the metal, analyze it and use it in a crucible furnace or other suitable melting unit.

When scrap is melted, the chance that large amounts of metallic oxides will be present must be considered, and deoxidizing must be done with care. If insufficient treatment is practiced, gas and metal full of undissolved oxides may result. Overuse of a deoxidizer causes too large a a residual amount, which also has a harmful effect.

The following degassing practice should be used in melting scrap for the best percentage of gas-free metal; I have used it for some time with consistently good results.

Raise temperature to about 100° F above the pouring temperature. First plunge about 3 oz of 15 per cent phosphor-copper per 100 lb, then 2¼ grams of lithium per 100 lb to the bottom of the crucible. Stir gently, allowing for equilibrium to be established. Pour soon after the lithium has been added. This step prevents loss of the protective residual lithium, which prevents oxygen pick-up in handling and pouring.

Lithium is claimed the most effective deoxidizer known, but it must be introduced with caution. Completely deoxidized metal is subject to high shrinkage. This factor must be provided for in the gating and risering. A little practice and a few test cocks will help. Lithium may be purchased scaled in short lengths of copper tubing in various amounts.

A few charges used in actual practice follow:

Crucible

60 lb	Yellow Ingot No. 1
560 lb	Mixed Radiator Cores

Rotary

250 lb	Copper Tubing
510 lb	Yellow Punchings
1750 lb	Mixed Radiator Cores

Rotary

900 lb	Gates
800 lb	Borings
112 lb	Yellow Ingot No. 1

Rotary

500 lb	Gates
250 lb	Copper Scrap
500 lb	Yellow Ingot No. 1
1775 lb	Mixed Radiator Cores

Rotary

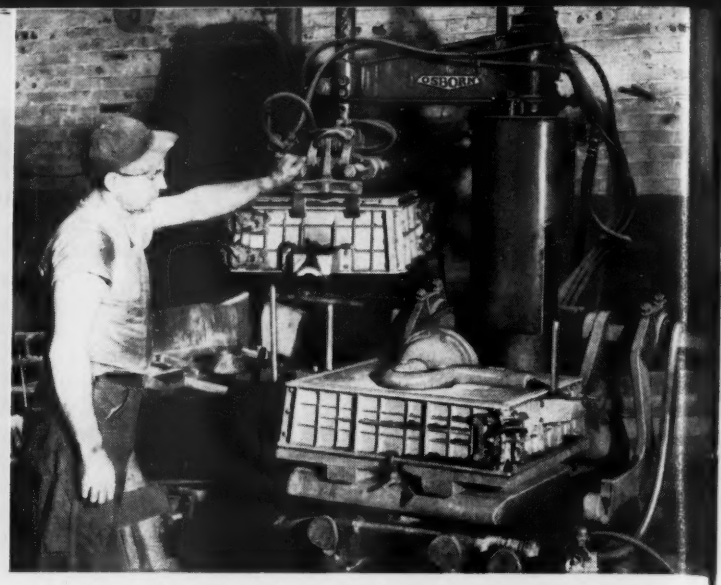
120	Gates
600	Borings
200	Copper Scrap
500	Yellow Ingot
1186	P. S. Ingot
524	Radiator Cores

Issues Safety Booklet

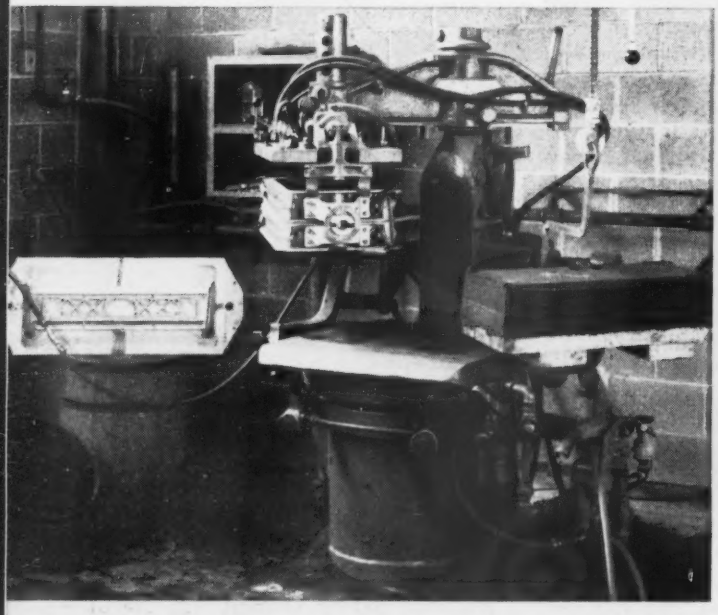
"What's in It For Me," the National Safety Council's new booklet, tells the skeptical worker what he gains from a good safety program. The booklet uses few words, but plenty of cartoons, to put across its message—no one is immune to accidents if he is not careful. Quantity prices and a sample booklet are available from the National Safety Council, 425 North Michigan Ave., Chicago 11.

INDIAN FOUNDRYMEN: The Foundrymen's Training Center at the Indian Institute of Technology, Kharagpur, India, graduated its first class this summer. Shown above is this class of foundrymen, most of them foremen, who received three months of training under direction of John Schnur, foundry technologist, Armour Research Foundation, Illinois Institute of Technology, Chicago. The program in India is under the joint sponsorship of the Indian government, Institute of Indian Foundrymen, Indian Institute of Technology, and U. S. Technical Co-operation Mission in India. Mr. Schnur, shown in the first row center with his wife, has been in India since 1952 advising the foundry industry

Turns out twice as many molds per manhour. Castings are uniform size, top quality for high pressure service.

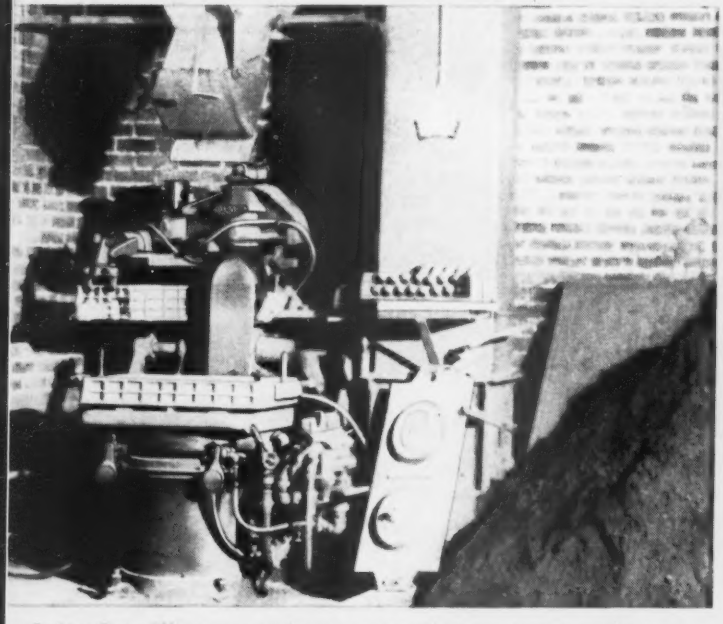


2 to 3 times the molds per day increases production efficiency of fittings with match-plate patterns. Photo shows operator swinging cope into position for closing the mold.

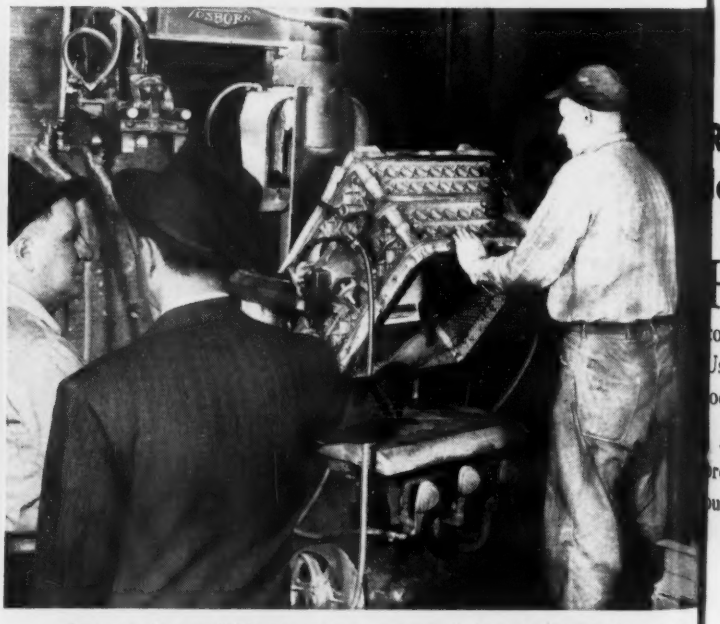


Nine times the production per man. One molder with one helper used to turn out 20 molds a day. Now, with Rota-Lift, this foundry turns out 90 molds a day with one molder . . . without helper.

Doubles output per mold to cut costs. With Rota-Lift, operator can use larger flasks . . . make twice as many castings per flask.



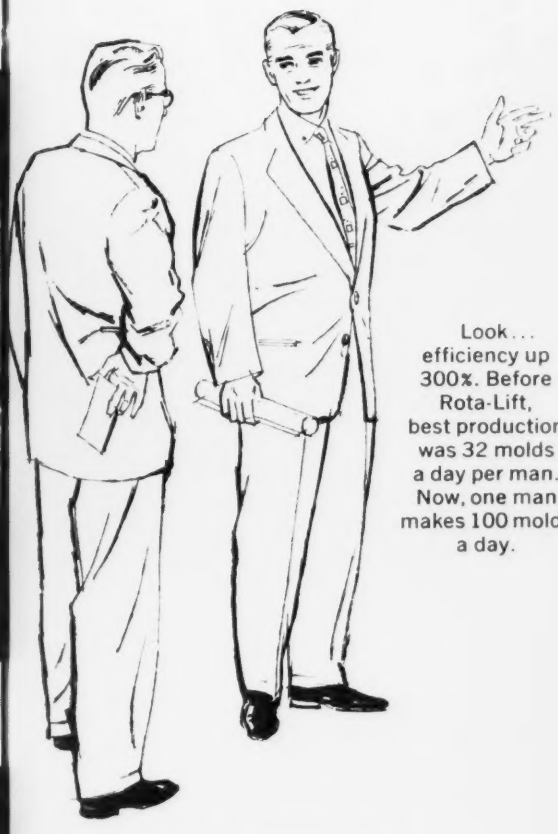
Before Rota-Lift, copes and drags were turned out on separate machines with 2-man teams. *After Rota-Lift,* both copes and drags are made on one machine with one man.



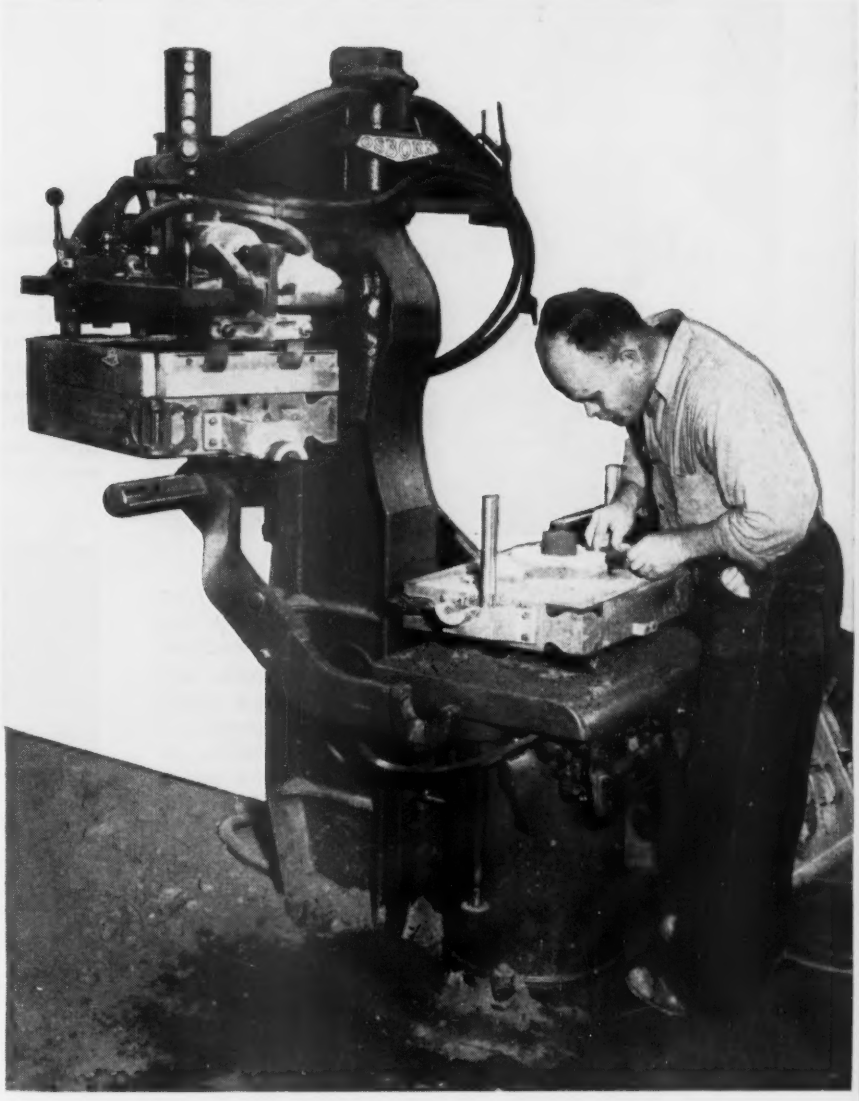
No more heavy lifting to reduce operator fatigue. Besides jolting and squeezing, Rota-Lift helps roll over mold, draw the cope and close the mold to cut foundry molding costs.

EVERYWHERE...efficient mold production starts with Osborn Rota-Lifts

Here's proof of savings on match-plate molding in all types of foundries.



Look... efficiency up 300%. Before Rota-Lift, best production was 32 molds a day per man. Now, one man makes 100 molds a day.



Rota-Lift mechanizes large match-plate molding

HEAVY manual effort is no longer needed to make molds. That's because Osborn's Rota-Lift helps roll over molds, draws the tope and closes the mold . . . *in addition to jolting and squeezing.* Using match-plate patterns, one man and one machine do what once took two men and two machines . . . *with savings as high as 300%.*

Ask your Osborn factory-trained specialist to look over your mold production. He can demonstrate where you can cut costs and turn out more accurate, higher quality molds. Call or write

THE OSBORN MANUFACTURING COMPANY
5401 Hamilton Avenue *Cleveland 14, Ohio*

OSBORN

MOLDING MACHINES CORE BLOWERS

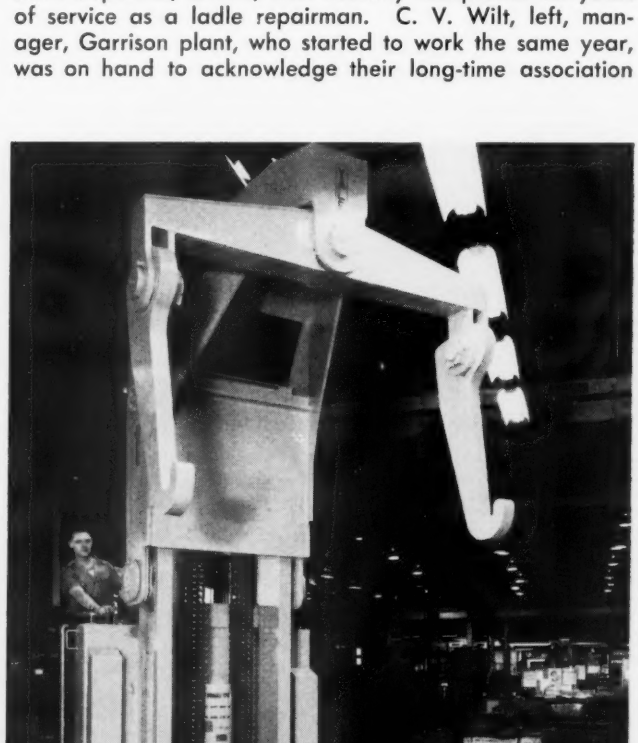
Another example of Osborn leadership and advanced engineering

NEWS VIEWS

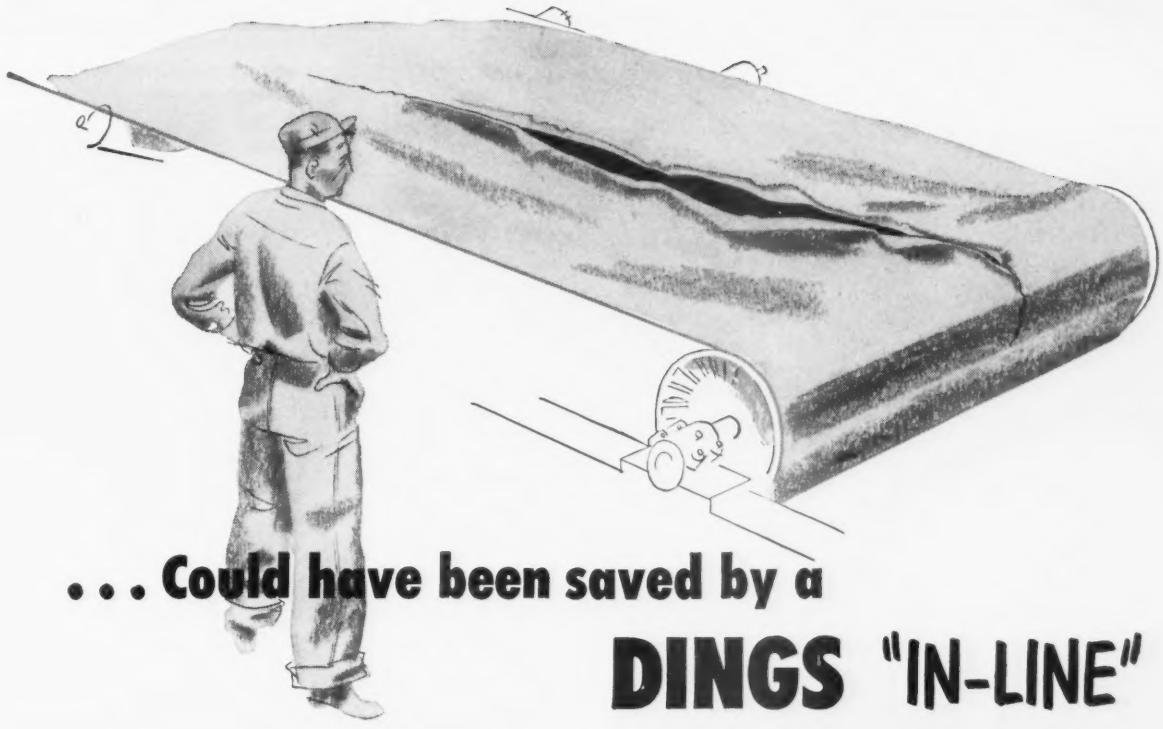
HOT STUFF: Thirteen years of production at Dravo Corp.'s Neville Island plant, Pittsburgh, recently has resulted in the completion of the 10,000th "Counterflow" industrial warm air space heater. If put under one roof, these heaters would heat a floor area of about 4 sq mi. Walter L. Davidson, above left, manager of the company's heating department, is shown driving the first spike into the blocking that will hold the honored unit on its journey to Sundstrand Machine Tool Co., Rockford, Ill.

HUGE CASTING: Production of this huge casting at Mesta Machine Co., Pittsburgh, required about 714,000 lb of steel. It is a section of the moving crosshead for a 50,000-ton hydraulic forging press being built by Mesta for the U. S. Air Force. An indication of its size is given by comparison with the height of the man at right

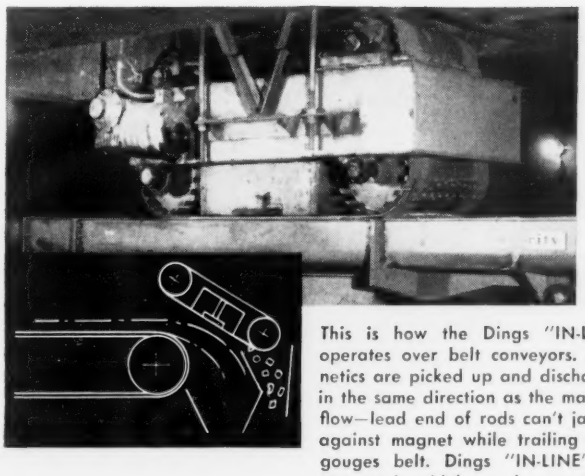
CENTURY OF SERVICE: Retirement has separated two friends whose combined service with Mackintosh-Hemphill Co., Pittsburgh, tops 100 years. Above, Col. J. S. Ervin, company president, presents an inscribed gold watch to John Sepetauc, center, who recently completed 50 years of service as a ladle repairman. C. V. Wilt, left, manager, Garrison plant, who started to work the same year, was on hand to acknowledge their long-time association



STRADDLE TRUCK: Problem of moving ladles of molten aluminum from furnace to pouring stations has been solved for the Aluminum Co. of America by this 20,000 lb capacity high lift crucible handling electric straddle truck. Built by Yale & Towne Mfg. Co., Philadelphia, the truck has an overall height of 154 in. with a maximum lifting hook height of 103 in. A diesel electric unit is used to provide power for drive and hoist operations



. . . Could have been saved by a DINGS "IN-LINE" MAGNET



This is how the Dings "IN-LINE" operates over belt conveyors. Magnetics are picked up and discharged in the same direction as the material flow—lead end of rods can't jam up against magnet while trailing edge gouges belt. Dings "IN-LINE" RM Magnet is widely used over vibrating pan conveyors.

RIPPED, destroyed conveyor belts are the usual result of trying to separate long iron rods from belt burdens with ordinary suspended tramp iron magnets.

Dings new "IN-LINE" Suspended Self-Cleaning Magnet eliminates this risk. Its self cleaning belt moves in the same direction as the conveyor over which it is suspended. The "IN-LINE" picks up and discharges tramp iron in the direction of material flow.

You can see the difference this makes — the leading end of a rod can't jam up against the magnet face while the trailing end digs into and rips the belt.

The "IN-LINE" is a self-cleaning version of the Dings RM rectangular magnet—the most efficient ever designed for removing tramp iron from conveyor belt burdens. Available in standard sizes to meet almost any belt speed, width or burden characteristic requirements. Write today for a copy of the new Dings RM Catalog, 1315-A. A note on your letterhead will do.

. . . the most complete line of electric and non-electric, permanent, Alnico Magnets and Magnetic Separators is available from Dings for the protection of your processing equipment and product. Learn about the application of magnets in industry . . . send for a copy of Catalog C-5000-B.

Dings

DINGS MAGNETIC SEPARATOR COMPANY

4708 West Electric Avenue • Milwaukee 46, Wisconsin

INDUSTRY BRIEFS

THOMPSON Products Inc., 23555 Euclid Ave., Euclid, O., has acquired Kolcast Industries Inc., 16601 Euclid Ave., Cleveland. Kolcast, producer of large castings for jet aircraft engines by the frozen mercury process, was acquired as a wholly-owned subsidiary by the exchange of stock.

* * *

Kaiser Aluminum & Chemical Sales Inc., 1924 Broadway, Oakland 12, Calif., has appointed Erin Metals Corp., 4040 Oakman Blvd., Detroit, as distributor of aluminum ingot in the Detroit area. Byron B. Clow has been appointed manager of a new branch office located at 310 West Liberty St. Bldg., Louisville 2.

* * *

Sandusky Abrasive Wheel Co., recently acquired as a wholly-owned subsidiary by Ideal Industries Inc., has moved to Sycamore, Ill. from Kalamazoo, Mich. The move will provide expanded research and manufacturing facilities and increased product development and quality control.

* * *

Fire Brick Construction Co., 70 Ludwig St., West Seneca, New York, representative for J. H. France Refractories Co., Snow Shoe, Pa., has announced the addition of new warehousing facilities in Gardenville, N. Y. The move provides increased service in the Buffalo area.

* * *

Lester B. Knight & Associates Inc., 600 West Jackson Blvd., Chicago 6, has acquired Dailey, Brenner & Schreiber Inc., management consultants. Dailey, Brenner & Schreiber Inc. will be operated as a division of the parent company with Lester B. Knight as chairman and Roger Kent Dailey as president. Mr. Dailey becomes vice president of Lester B. Knight & Associates.

* * *

Titanium Metals Corp. of America, 233 Broadway, New York 7, has achieved full capacity production of ten tons per day of high quality titanium sponge at its Henderson, Nev., plant. The new annual production rate at Henderson exceeds the combined 1952 and 1953 total output of titanium metal by all companies in the United States.

* * *

Ajax Electrothermic Corp., Trenton, N. J., has added a new air-conditioned building to its facilities at Trenton. This represents almost a 50 per cent physical expansion of the company's engineering and administrative departments.

* * *

Reliance Electric & Engineering Co., 1088 Ivanhoe Rd., Cleveland 10, is opening a direct factory sales office in Milwaukee. Vernon S. Barnes will be branch manager of the new office located at 5856 North Port Washington Rd., Milwaukee.

* * *

J. N. Fauver Co., 51 West Hancock, Detroit 1, has moved its branch office and warehouse from Dayton, O. to 5562 Montgomery Rd., Cincinnati. The move was made to serve a larger area.

* * *

Automatic Transportation Co., 149 West 87th St., Chicago 20, has appointed Emory M. Mumma, Bryn Mawr, Pa., its representative for Delaware.

* * *

Allis-Chalmers Mfg. Co., General Machinery Div., Milwaukee 1, has named Wheeling Rubber Products Inc., 927 Market St., Wheeling, W. Va., its Wheeling area distributor of V-Belt drive equipment. Wheeling Rubber Products is headed by R. A. Charlton.

* * *

Lindberg Air & Hydraulic Division, Lindberg Engineering Co., 225 North Laflin St., Chicago, has appointed Power Drives Inc., 562 South Park Ave., Buffalo, its exclusive representative for western New York. Power Drives Inc., owned by Lawrence C. Darbrake and Vincent G. Mansell, will handle a full line of air and hydraulic cylinders.

* * *

Reynolds Metals Co., 2500 South Third St., Louisville, has appointed two California firms to distribute aluminum pig and ingot in standard and special analysis alloys. The new distributors are Aaron Ferer & Sons Inc., 2300 East Eleventh St., Los Angeles, and Globe Metals Co., 1820 Tenth St., Oakland 20, Calif.

* * *

Lester Engineering Co., Cleveland, designer of injection molding and die casting machinery, has purchased Phoenix Machine Co., Cleveland. Purpose of the purchase is to increase production and integrate engineering, production and sales under one management.

* * *

Ken-Dick Corp., 1712 Fifteenth St. Place, Moline, Ill. and 6800 University Ave., Des Moines, Iowa, has been appointed by Republic Steel Corp., Cleveland, to distribute its materials handling equipment in Illinois and Iowa.

* * *

Palmer-Shile Co., Detroit, has added two new sales representatives. They are W. P. Woolridge Co. of 1183 Howard St., San Francisco 3 and 6440 Fleet St., Los Angeles 22, and Carl Krasny, 6801 Euclid Ave., Cleveland 3.

* * *

Howell-Lanier Engineering Sales, 4703 Ritchie Highway, Baltimore, has been appointed metropolitan Baltimore distributors for Raybestos-Manhattan industrial rubber items.

* * *

Frederic B. Stevens Inc., Detroit, has opened a new district office and warehouse at 4000 East 16th St., Indianapolis 7, Ind.

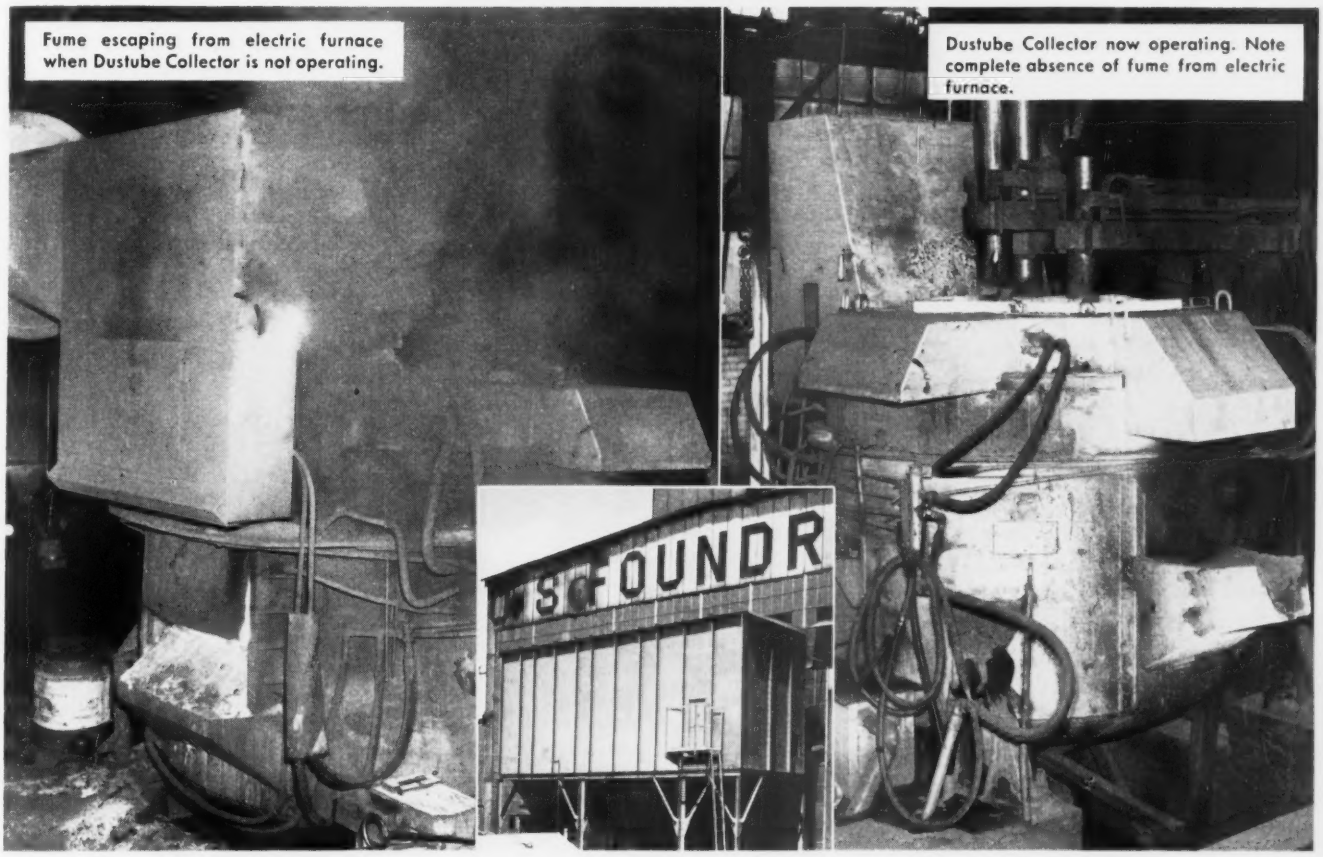
* * *

Appleton Electric Co., 1701-1759 Wellington Ave., Chicago 13, has acquired controlling interest in the Illi-

(*Concluded on page* 154)

MORE FORK LIFT TRUCKS: New plant designed to streamline production facilities has been built by Towmotor Corp., Cleveland. Centralizing of departments will be made possible by this addition of 155,000 sq ft of space. In addition, the new plant will make space available in existing buildings for an expansion in research and development activities

pioneering developments keep **DUSTUBE®** *first in dust control*


Fume escaping from electric furnace when Dustube Collector is not operating.
Dustube Collector now operating. Note complete absence of fume from electric furnace.

Eliminate Air Pollution From Electric Furnace Fume

Dustube Collectors Provide Highest Efficiency in Controlling Fume From Electric Steel Melting Furnaces

Atmospheric pollution from electric steel melting furnaces need no longer be a problem. Dustube cloth tube type Collector systems provide virtually complete removal of fume, discharging only clean gas. Such a system installed at a progressive Chicago steel foundry for ventilating two 5-ton electric furnaces collects weekly over five tons of very fine dust and fume which formerly dispersed into the atmosphere.

Only filtration can be depended upon to yield an effluent gas free from visible solids. And, in the modern Dustube Collector such efficiency reaches its highest peak. Other important reasons why leading steel foundries have selected the Dustube Collector for controlling this fume problem are:

1. Dustube's operation is continuous and automatic.
2. No manual labor is required and no delays are experienced for shaking down the collected fume.
3. Because of its simple design, Dustube Collectors cost less to install, operate and maintain than other types of fume control equipment.
4. Wheelabrator's wide selection of natural and synthetic fabrics provides just the right filter cloth for the application—field tested over long periods of time.

If you are interested in thorough dust or fume control at a price you can afford to pay, investigate the Dustube Collector. Feature by feature the Dustube proves its advantages. American engineers will gladly consult with you at any time without obligation.

Write today for full information.

Write for your copy of Catalog 372 today.

American

WHEELABRATOR & EQUIPMENT CORP.
505 S. Byrkit St., Mishawaka, Ind.

dustube®
COLLECTORS

(*Concluded from page 152*)

nois Malleable Iron Co., Chicago. The company will be operated as a subsidiary of the Appleton Electric Co.

* * *

Mercast Corp., 295 Madison Ave., New York 17, has purchased the entire outstanding capital stock and equipment of Industrial Metal Casting Corp., Cleveland. The plant and its equipment have been sub-leased to a Mercast licensee and affiliate, Alloy Precision Castings Co., Cleveland, to provide additional manufacturing facilities.

* * *

Tincher Products Co., Sycamore, Ill. has moved its headquarters to 2023 South 60th St., Milwaukee. The company, a manufacturer of equipment and sealants for impregnation sealing, has been operating impregnating facilities in Milwaukee.

* * *

Brandt Brass & Aluminum Foundry, Chicago, has moved its operations to Merrill, Wis.

* * *

Bone Engineering Co., 701 West Broadway, Glendale 4, Calif., recently added 21,000 sq ft to its main plant making a total of 50,000 sq ft. Production increases since the acquisition of an investment casting department have made enlarged facilities necessary.

* * *

Tabor Mfg. Co., manufacturer of foundry molding machines and equipment, has become a division of Turbo Machine Co., Lansdale, Pa. The complete line of Tabor equipment will be made in Lansdale. No change has been made in the sales-engineering staff.

* * *

Abrasive & Cutting Tools Co., 4141 Lakeside Ave. N. E., Cleveland, has been formed to offer sales and engineering services. A. J. Schneider and E. G. Hober, both formerly with Sterling Abrasives Division, Cleveland Quarries Co., are partners in the new firm.

* * *

Thew Shovel Co., Lorain, O. has completed arrangements to purchase controlling stock of Dixie Crane & Shovel Co., Harrisburg, Pa. The purchase was made to extend Thew Shovel's market coverage.

* * *

Trabon Engineering Corp., 1840 East 40th St., Cleveland, has appointed the R. E. Kunz Co., 408 Broad St., Seattle, its distributor for Washington and part of Idaho. The Kunz company will supervise the installation and maintenance of oil and grease systems.

* * *

Aget Mfg. Co., Adrian, Mich. has combined sales and manufacturing divisions at its executive headquarters, 1408 East Church St. Previous sales of the company's dust and vapor collectors were made through marketing headquarters in Ann Arbor, Mich.

* * *

Lewis - Shepard Products Inc., Watertown, Mass., has appointed two new sales and service representatives. They are Merle Thayer, 1618 West 34th St., Davenport, Iowa, and Ray W. Thom, 7427 North Denver Ave., Portland, Oreg.

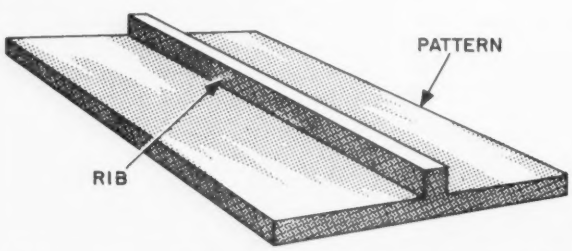
* * *

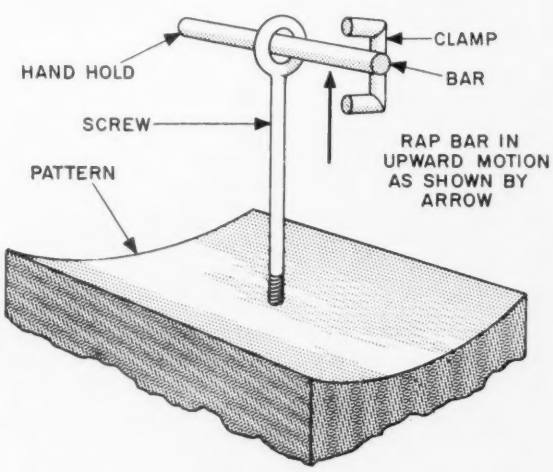
Chem'ray Inc., 22290 Lakeland Blvd., Euclid, O., has started an x-ray analysis service for castings and weldings. Edward Haylett heads the operating staff.

* * *

Industrial Crane & Hoist Co., formerly of 341 North Ada St., Chicago 7, has moved to a new and enlarged plant at 1536 South Paulina St., Chicago 8.

HOW TO DO IT





Ideas Are Offered for Quick Mold Repair and Safe Pattern Rapping

By L. H. BAKER
Mabry Foundry & Machine Co.
Beaumont, Tex.

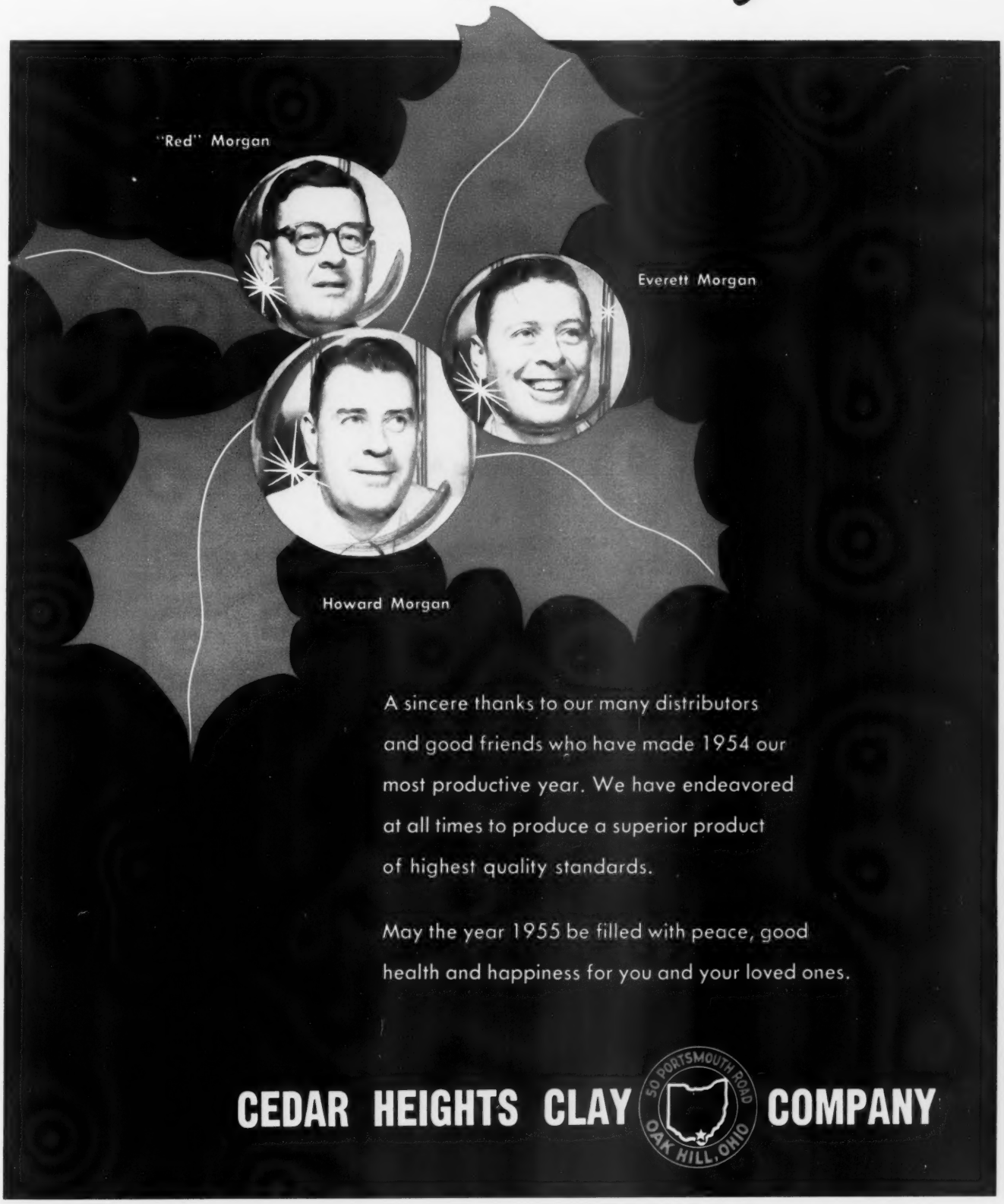
FLEXIBLE patterns sometimes are reinforced with a rib or ribs to prevent sagging during ramming of the mold. Such a rib usually is placed on the drag side of the pattern, and the resulting mold cavity then is filled with molding sand after the pattern has been drawn. Much time is spent in subsequent smoothing of the mold where the fill sand was used.

A quicker way to fill the cavity is to use dry, sharp sand instead of prepared molding sand. Metal will not penetrate the dry sand and the casting surface will be as smooth as that produced by the molding sand repair.

HERE'S ANOTHER IDEA. Damage to patterns from use of a rapping spike and hammer to loosen it before removal from the sand can be avoided by mounting one or more eye screws in the pattern. Then by inserting a rod in the eyes and rapping upward on the rod the pattern can be loosened without damage.

Do you have any tricks of the trade tucked away with your foundry experience? Why not release them to fellow foundrymen? FOUNDRY will pay a minimum of $15 for each idea submitted and published. Send a photo or drawing with your idea

Season's Greetings



A sincere thanks to our many distributors and good friends who have made 1954 our most productive year. We have endeavored at all times to produce a superior product of highest quality standards.

May the year 1955 be filled with peace, good health and happiness for you and your loved ones.

CEDAR HEIGHTS CLAY COMPANY

50 PORTSMOUTH ROAD
OAK HILL, OHIO

FOUNDRY DEVELOPMENTS

By EDWIN BREMER

Metallurgical Editor

JAPANESE investigators Iitaka and Nakamura describe the effect of bubbling various gases through a molten pig iron in which it was difficult to obtain either normal graphite or spheroidal graphite. This appears in *Report of the Castings Research Laboratory* (No. 5, 1954) of Waseda University, Tokyo. Gases tried were chlorine, air, oxygen, hydrogen and natural gas.

Without additions of magnesium, bubbling with chlorine and hydrogen gave little structural change; with air and oxygen, eutectic graphite predominates with little flake graphite present. With addition of magnesium without bubbling, graphite did not become spheroidal at up to 0.5 to 0.6 per cent Mg. With chlorine bubbling, spheroidal graphite was obtained with 0.5 per cent Mg; with air, spheroidal graphite was otbained with 0.4 to 0.5 per cent Mg, while with oxygen 0.3 per cent Mg gave spheroids and a ledeburite matrix. With hydrogen and natural gas bubbling, bull's-eye structure appeared with 0.2 per cent Mg, and perfect spheroidal graphite with 0.3 per cent Mg.

♦ ♦ ♦

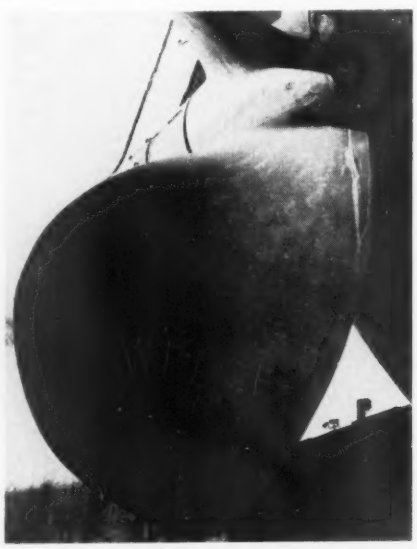
NEW instrument developed by General Electric Co. engineers permits magnification and x-raying of substances smaller than the human eye can see. Called the X-ray Microscope, the device is capable of wide use in industry, biology and medical science since it magnifies up to 1500 diameters and allows study of grain structure in metals, cell structure of bones and human tissue and other subjects opaque to light. Principal feature of the new instrument is an electrostatic lens system which provides an x-ray source 300 times smaller than a human hair. Conventional x-ray source cannot be made smaller than about ⅛-in. in diameter, and a source as small as 0.001-in. gives magnification no greater than an ordinary reading glass.

♦ ♦ ♦

NEW process for recovery of zinc from galvanizing dross has been developed by the Briitsh Iron and Steel Research Association. according to an article by A. G. Thomson in the October issue of *Metallurgia* (Manchester, England). Process is based upon the facts that aluminum has a greater affinity for iron than zinc, that the compound of iron and aluminum formed requires only 1½ parts Al to 1 part Fe, that the Al-Fe alloy formed is much lighter than Zn and has a high melting point, and that the solubility of Zn in Pb is only 2 per cent at the freezing point of Zn (418° C), but 14 per cent at 720° C. Procedure is to add enough Al to the molten dross to combine with the Fe present, and the mixture is heated in a lead bath to a temperature of 700° C or slightly above. Increased difference in density between the Fe-Al alloy and the Pb-Zn alloy makes former easy to remove. Bath then is cooled until the Zn solidifies and is removed.

♦ ♦ ♦

AFTER a year's continuous service, buffing swirl marks still are plainly visible on the surface of the five-blade propeller of the *S.S. American Clipper* shown in the accompanying illustration. Propeller is made of an alloy of copper, nickel, aluminum and other elements called Nialite which was developed by Baldwin-Lima-Hamilton Corp., Philadelphia. Alloy



has high resistance to cavitation and erosion, is light in weight, and possesses high tensile strength. Propeller was about 20 per cent lighter in weight than a manganese bronze one for the same ship. That means less bending stress in the tail shaft and minimum wear in reduction gearing due to low longitudinal shaft vibration. High tensile strength of the alloy permitted reducing blade root thickness from 9 to 7 in. which provides considerably better efficiency in operation.

♦ ♦ ♦

SUCCESSFUL procedure for application of aluminum pigment paint for resistance to high heat was developed by San Patricio plant, Reynolds Metal Co., Corpus Christi, Tex. for its diesel exhaust stacks. Stacks first were cleaned by sandblasting and then given a gray primer coat. Engines were started and run for 24 hr. Engines were shut down, aluminum-silicone paint applied and the engines immediately started to bring the stacks up to full temperature, which normally is 950°F; occasionally it reaches 1100°F. After 2½ years condition of the paint is excellent.

♦ ♦ ♦

GIANT ceramic tube that can stand up under extreme temperature changes has been developed by Electro Refractories & Abrasives Corp., Buffalo. Tube is 6 ft long with an OD of 6½ in. and an ID of 3½ in. It is employed in the special casting technique for making cast steel freight car wheels originated by Griffin Wheel Co., Chicago. In this process the graphite mold containing the casting cavity is positioned above a reservoir or tank containing molten steel. The steel at about 3000° F is forced upward through the ceramic tube into the mold cavity by application of air pressure on the surface of the molten steel bath. Since one end of the tube is immersed in molten steel and the other fits tightly to the opening into the relatively cooler mold, temperature differentials may reach as high as 2000° F which requires high resistance to thermal shock. Additionally the tube must not boil or cause any reaction which will contaminate the steel.

♦ ♦ ♦

SPECIAL heat-resistant rubber tube, protected by asbestos for heat and armored with wire for strength, has served for more than 270 heats in circulating water in hollow steel doors of an open-hearth furnace, according to Industrial Products Division, B. F. Goodrich Co., Akron, O. Build-up of slag on the hose is reduced by the newly developed hose construction which also permits the use of shorter lengths to make connection between the movable doors and the water circulating system.

♦ ♦ ♦

INVESTMENT material described in U. S. Patent No. 2,675,322 is composed of 80 to 90 per cent silica with 5 to 9.5 per cent fused magnesium oxide powder, about 4 to 6 per cent mono ammonium phosphate powder, and approximately 1½ to 4 per cent mono magnesium phosphate powder. From 50 to 80 per cent of the silica is larger than 60-mesh and the remainder smaller than 60-mesh.

DAVENPORT MACHINE AND *Foundry Company*

DAVENPORT, IOWA, U.S.A.

Progressive molding

SOLVES MANY PROBLEMS

Molds are produced at the rate required to perform only one of the operations, instead of at the rate required to complete a mold.

Machines are of the simplest design since each one performs only one operation.

Maintenance is reduced to a minimum because of the simple design of the machines.

Operations for repetitive work are performed automatically.

Most operations for non-repetitive work can be performed automatically.

Work stations for non-repetitive or short run work are arranged to change patterns frequently without interrupting any of the other operations.

Sand distributing equipment is simplified because there is only one flask filling position instead of a row of hoppers.

Unskilled men can be trained quickly to perform the easy manual operations.

Skilled men devote their entire time to the tasks which require their skills.

Performing operations progressively in the making of molds from match plates permits the use of larger patterns, because:

Rolling over the mold assembly is performed mechanically without consuming time;

The cope is drawn hydraulically and carried to the closing position without further handling;

Closing is also performed mechanically.

There are many other advantages to "Progressive Molding" which become apparent when each molding problem is analyzed.

Request one of our Engineers to explain how "Progressive Molding" can be applied to your molding operations.

FERROUS AND NONFERROUS PRACTICE

Discussed at New England Regional Conference

By KENNETH L. MOUNTAIN
and
JACK C. MISKE
Assistant Editors

OVER 400 New England foundrymen registered for the 14th New England Regional Foundry Conference, held Oct. 29-30 at Massachusetts Institute of Technology, Cambridge, Mass. Conference was sponsored jointly by the New England Foundrymen's Association and MIT in co-operation with other technical groups of the area.

Conference was opened by Joseph B. Stazinski, General Electric Co., Everett, Mass., conference chairman. He introduced C. Richard Soderberg, dean of engineering, MIT, who welcomed the delegates to the conference and to MIT. Assisting Mr. Stazinski in heading the conference arrangements were Henry G. Stenberg, Draper Corp., Hopedale, Mass., vice chairman, Ahti Erkkinen, BIF Industries Inc., Providence, R. I., ferrous program chairman, and Stafford W. Chappell Jr., General Dynamics Corp., Groton, Conn., nonferrous program chairman.

Two general meetings, four ferrous and four nonferrous sessions, and two casting clinics made up the technical program. Conference dinner at the MIT Faculty Club on Friday evening featured a talk by Gerry Moore, baseball writer, of the *Boston Post*. He discussed various aspects of major league baseball as he has observed them in following the Boston Red Sox. A lengthy question and answer period proved highly entertaining and enlightening. Post-conference smoker, sponsored by local representatives of foundry equipment and supply houses, was held Saturday night at the Parker House Roof, Boston.

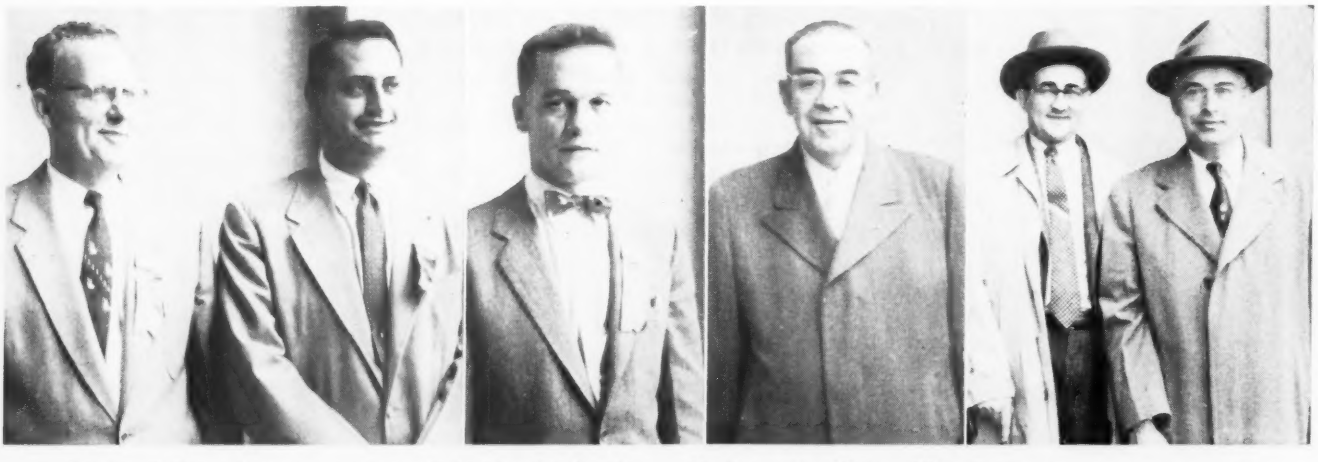
F. E. Murphy, Walworth Co., Boston, F. S. Brewster, Harry W. Dietert Co., Detroit, and T. E. Barlow, International Minerals & Chemical Co., Chicago, presented an **Evaluation of the Shell, 'D', and Pressure Molding** processes at the first general session. While there was a difference of opinion expressed by the speakers as to the relative merits of each process it was generally agreed that each method had its specific applications in the industry. Each method is in itself an attempt to produce better castings having closer dimensional accuracy with smoother surfaces at higher production rates and reduced costs through use of less skilled labor. The processes require increased emphasis on good equipment, more accurate patterns and, where needed, tight-fitting flasks.

At the first ferrous session, Clyde A. Sanders, American Colloid Co., Chicago, talked on **A Foundry Disease—Casting Defects?** Mr. Sanders illustrated his remarks with many colored slides of fundamental casting defects with comments on probable causes. According to the speaker, all the defects presented indicated that there can be no substitute for good management and supervision, good foundry practice, good equipment, good melting, degassing, and alloy additive procedures, and sound gating techniques.

Lester B. Knight, Lester B. Knight & Associates, Chicago, was the speaker at the second ferrous session. In his talk, **Materials Handling,** he emphasized that, basically, foundries are operations of materials handling and control since 400 tons of material are handled for every 100 tons of castings produced. Mr. Knight said that to stay in business and compete successfully in a growing and expanding economy, foundries must analyze themselves and establish methods, procedures and controls to permit maximum production with minimum man-hours and materials consumption to provide an adequate return to labor and management.

Speaker at the second combined session of the ferrous and nonferrous groups, which opened the Saturday meetings, was Kenneth G. Yost, National Metal Trades Association, Chicago. His subject was **Total Power,** a discussion of human relations. The old privileges of leadership are antiquated, he stated. Power, authority, money, material facilities, fringe benefits, "cold" education and similar factors are not enough to cement good human relations. Understanding and the ability to live and work together, at all

(*Continued on page* 161)

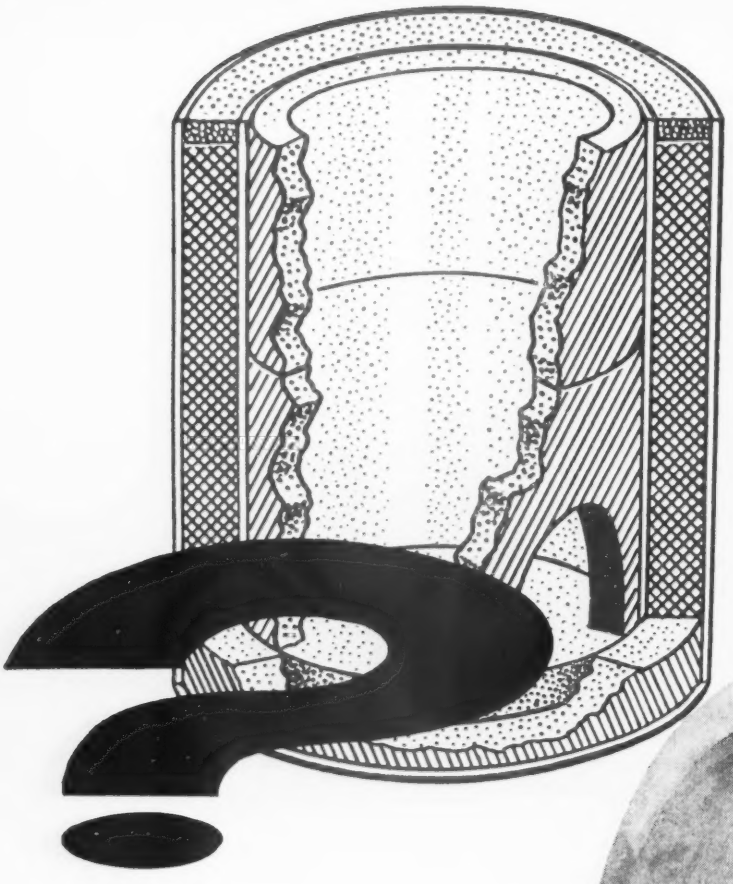


Depicted above between sessions of the New England Regional Foundry Conference are, left to right: H. G. Stenberg, Draper Corp., conference vice chairman; H. M. Frechette, Fitchburg Foundry Inc.; Ahti Erkkinen, BIF Industries, ferrous program chairman; Herbert H. Klein, Klein-Farris Inc., treasurer of the conference; Prof. Howard F. Taylor, MIT, and Joseph B. Stazinski, General Electric Co., chairman of the conference. Photographs are through the courtesy of C. A. Wyatt, Debevoise-Anderson Co.

Thiem PRODUCTS, INC., MILWAUKEE 14, WISCONSIN

and distributors

Brumley-Donaldson Company	Los Angeles and Oakland, Cal.
Canfield Foundry Supplies & Equipment	Kansas City, Kansas
Combined Supply & Equipment Co., Inc.	Buffalo, New York
G. H. Draper Company	Houston, Texas
Eastern Foundry Supplies, Inc.	Newark, New Jersey
Kramer Industrial Supply, Inc.	Denver, Colorado
LaGrand Industrial Supply Co.	Portland, Oregon
Manufacturers Equipment & Supply Co.	Chattanooga Tenn. and Birmingham, Ala.
Western Foundry Sand Company	Seattle, Washington
Walter A. Zeis	Webster Groves, Mo.
Don Barnes Foundry Supplies & Equipment	Hamilton, Ontario, Canada



What do you look for in a Nonferrous Furnace Lining?

EASE OF INSTALLATION?

This ring/cement lining is made of 1½" thick CARBOFRAX® silicon carbide rings, backed by 2½" or more of ALFRAX® aluminum oxide castable cement. The rings weigh about 70 pounds apiece, light enough for one man to handle without a hoist. They go in easily: a complete relining job, including preparation and pouring of the ALFRAX cement, takes only an hour and a half.

LONG LIFE?

The CARBOFRAX rings make one of the most durable linings known. They resist flame erosion, spalling and cracking, and will go many months with little or no patching. Because of these properties, it is practical to make them thinner than would be possible with other refractory materials. This leaves more room for the ALFRAX cement, one of the most efficient refractory insulations you can find.

LOWER FUEL COSTS?

The ALFRAX cement reduces heat capacity of furnace and cuts heat losses to a minimum. You use considerably less fuel per pound of metal, and can actually increase the number of melts you turn out (operators report one and sometimes two extra heats per day).

CARBORUNDUM supplies lining materials and shapes to fit every crucible furnace. Let us know your operating conditions and we'll be glad to make recommendations. There's no obligation — simply address Department A-124, Refractories Division, The Carborundum Co., Perth Amboy, N. J.

CARBORUNDUM
Registered Trade Mark

(*Continued from page* 158)
levels in an organization, are necessary. Men in industry must forego commonly held negative attitudes and replace them with positive ones.

Prof. Howard F. Taylor, MIT, briefly discussed the foundry program at MIT and said there was increased emphasis over the last ten years on undergraduate study in the foundry field. New foundry facilities, soon to be completed, will enable the institute to better serve its students and the New England foundry industry and create an atmosphere that should be mutually beneficial to all concerned.

Reducing Cleaning Costs in a Jobbing Foundry was the subject of C. W. Mooney Jr., Olney Foundry, Link-Belt Co., Philadelphia, at the third ferrous session. Mr. Mooney used slides to illustrate the procedures

(*Concluded on page* 164)

STEEL FOUNDERS' SOCIETY RECEIVES SAFETY AWARD

From National Safety Council for Outstanding Work

STEEL FOUNDERS' SOCIETY of America has been cited by the National Safety Council for its outstanding work in promoting safety in the plants of its 159 members. The award was presented during sessions of the 42nd National Safety Congress in Chicago Oct. 18-22. Ten other trade associations received similar awards, but the SFSA was the only metalworking group so honored by the National Safety Council.

The award gives recognition to associations for the general excellence of their safety services and their contribution to the reduction of occupational injuries in their industries. Recognition is based only on safety accomplishment and effectiveness of program, not upon expenditure for safety or number of years of safety activity. The award is noncompetitive.

Purpose of the award is fourfold: To promote more effective activity in existing association safety programs; to stimulate other associations to encourage greater safety effort on the part of member companies; to help collect association safety material, statistics and cost information which will enable the council better to serve its members; and to foster more cooperation between associations and safety organizations.

The SFSA has had an accident prevention program since 1941, at which time the first SFSA safety committee was formed and the first society safety statistics collected. From 1941 until 1943, the accident frequency rate was over 40, but since 1943 the trend has been steadily downward. It was 23.9 in 1952 and 19.2 in 1953, a reduction of 19.6 per cent.

The safety committee of the SFSA plans the safety program. There is no full-time staff safety director, but staff members co-ordinate committee activities. Each of the eight committee members represents a geographical division of the society, works closely with his division director, heads the division safety committee, conducts safety meetings and disseminates national safety activity information to all division members. In 1953 the committee met three times, as it will again in 1954. The budget allocated for safety activities was increased in 1953 from $1600 to $4500.

Many activities make up the society's safety program, including the following: An annual safety poster contest; an annual safety contest; regular mailings to members of safety articles significant to the industry; an annual analysis of accidents occurring in members' foundries; and maintenance of a library of safety manuals and safety rules. Items regularly mailed to members include a monthly *Lost Time Summary; Serious Accident Bulletins* (information on serious accidents, sent out in the weekly mailing); safety posters; reprints of articles; and other safety literature.

Outstanding safety records of members are publicized in trade journals. *Steel Foundry Facts*, the monthly society publication, carries articles on safety, safety statistics and abstracts of current magazine safety articles. During 1953, nine case histories of successful safety programs were collected and reported for all members' use in early 1954 editions of *Steel Foundry Facts*. Safety talks are given at both divisional and national meetings of the society.

Above all, the society attempts to sell management the idea that safety pays, for no safety program can succeed without management support.

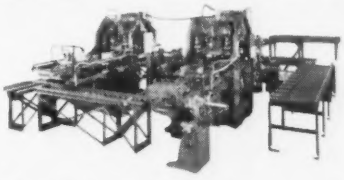
E. C. McFadden, center, vice president for industry, National Safety Council, and vice president, Texas Employers Insurance Association, Dallas, Tex., presents the NSC safety award to Earl M. Layman, right, director of personnel, General Steel Castings Corp., Granite City, Ill., chairman of the Steel Founders' Society of America safety committee. On the left, F. Kermit Donaldson, SFSA executive vice president, is a spectator at the presentation

"WE'VE GOT A H

"That's right, son, we're competitive with the best of them . . . now that we've got our new SPOMATIC!"

A recent survey showed that many large jobbing and production foundries are being caught in "the middle." They are trying to meet stiffer competitive prices while operating antiquated inefficient equipment. With fully automatic molding machines making even "new" standard equipment obsolete almost overnight, survival will depend more than ever on the ability to produce more for less.

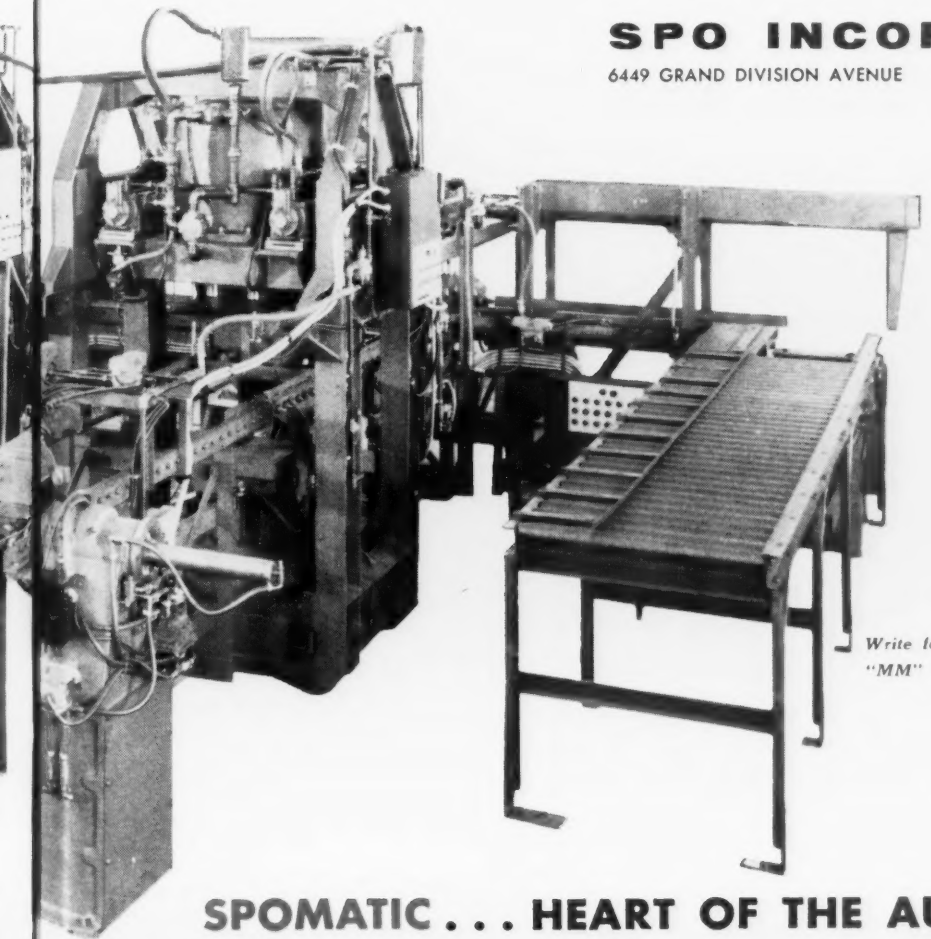
A HEAD START ON TOMORROW . . . TODAY!"



The SPOMATIC provides the most economical, high-speed, efficient means of automatic production molding available today. Operating with minimum supervision and effort, it will outproduce any other molding equipment. The SPOMATIC molds copes and drags simultaneously. Once it is started, all operations are fully automatic, mechanical and continuous.

The SPOMATIC will give you an edge on competition . . . permit tremendous savings that will amortize initial costs quickly . . . and will keep your production jobs profitable.

SPOMATIC installations are engineered to individual foundry requirements. SPO engineers will be glad to discuss your needs . . . to give you a head start on tomorrow today!



SPO INCORPORATED

6449 GRAND DIVISION AVENUE • CLEVELAND 25, OHIO

WORLD'S LARGEST SUPPLIERS SPO OF MOLDING MACHINES

Write for Bulletin "MM" for additional details.

SPOMATIC . . . HEART OF THE AUTOMATIC FOUNDRY

3076-5

(*Concluded from page* 161)

followed to establish improved methods in their cleaning room to handle the output of a molding department that was being mechanized to double its prewar output of 400 tons per month. Detailed study of cleaning room operations had the effect of causing all other departments to look at their own operations to see where a redesign or changed procedure would save time, material and money.

At the fourth ferrous session Walter R. Jaeschke, Whiting Corp., Harvey, Ill., spoke on **Cupola Practice.** In his informative talk, Mr. Jaeschke described the construction and design of a cupola, outlined its advantages over other melting methods, elaborated upon necessary controls of raw materials, heat, blast and charging techniques to develop the unit's full efficiency. Many operational hints also were offered.

Final ferrous session was a casting clinic featuring a variety of castings from Draper Corp., Hopedale, Mass., to illustrate the standard gates, risers and runners used in their operation. James Stringfellow, assistant foundry superintendent, Draper Corp., led the general discussion and answered many questions directed from the floor.

To open the nonferrous sessions William Romanoff, H. Kramer & Co., Chicago, spoke on **Brass and Bronze Foundry Practice for Pressure Castings.** He pointed out that poor castings usually are caused by bad gating, wrong pouring temperature, weak sand practice or other elements of foundry practice, not by the metal, which is commonly and unfairly blamed for foundry defects. This point also was made by later speakers. To illustrate his point Mr. Romanoff described how scrap is refined for foundry use by producers of secondary metal.

Mr. Romanoff warned against soaking metal. It can be held, however, if it is melted with an oxidizing atmosphere, zinc loss is replaced and pouring temperature is right. He suggested that a simple quality control program to keep records of changes in foundry practice saves money in the long run. Metal should be poured no hotter than is necessary to avoid misruns. As temperature rises, so does gas absorption.

In a discussion of **Practical Aspects of Aluminum and Aluminum Alloys,** Charles Batchelder, Charles Batchelder Co., Botsford, Conn., emphasized that aluminum is still a new metal in human technology, despite its widespread applications. He predicted that its use would continue to increase, particularly in the automotive industry.

After remarks on the properties of various aluminum alloys, the speaker noted that gas porosity is a major problem with aluminum. He stressed that gas in the mold cavity is just as important as gas in the melt. Castings must be fed and chilled properly. Chlorine is perhaps a more efficient degassing agent than nitrogen, but it picks up magnesium and tends to coarsen grain of the metal. Fluxes also are good degassers.

Description of a permeable plaster featured **Plaster Molding,** a paper by Robert Megaw, U. S. Gypsum Co., Chicago. Air bubbles are the source of the permeability. (See FOUNDRY, Nov. 1, 1954, p. 52) Mr. Megaw also discussed other types of plaster. He explained that plaster is an economical molding material only when good finish and close tolerances are required. His presentation included showing of a film which depicted how plaster molds are used to make aluminum matchplates at Scientific Cast Products Co., Chicago.

Robert A. Colton, Federated Metals Division, American Smelting & Refining Co., Newark, N. J., talked on **Melting Practice,** but stressed that melting has been overemphasized to such a degree that some foundrymen tend to neglect other, equally important factors. Good aluminum melting practice has three aspects: 1. Charge clean material; 2. Melt neutral or oxidizing; 3. Melt quickly, without stewing.

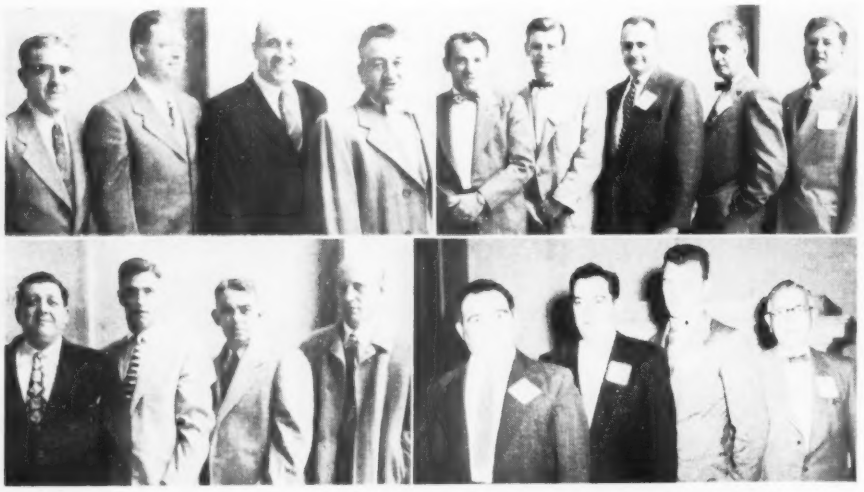
Overheated metal loses some of its absorbed gas if it is permitted to cool on the floor. Stirring merely mixes in oxide and may cause hard spots. Vacuum testing shows the presence of gas, but even degassed metal can be ruined in the mold if gating and risering are not adequate. A little gas often helps to avoid shrinkage porosity.

Brass Melting Practice

Good brass melting practice begins with the same three steps prescribed for aluminum and also includes skimming (on the floor) and deoxidizing. Plunging zinc to the bottom of the pot makes up zinc loss and also deoxidizes, but the plunging operation is difficult to accomplish.

An important aspect of good melting practice is care in transfer of hot metal from furnace to ladle and from ladle to mold. Turbulence and riser vortexing should be avoided.

Final nonferrous session was a casting clinic. Each participant spoke briefly; then the meeting was opened to questions and answers of mutual problems. Speakers were Fran Wolfer, American Hardware Co., New Britain, Conn., who discussed quality hardware castings; Robert Sheldon, Springfield Bronze & Aluminum Co., Springfield, Mass., whose subject was quality control; Kneeland McIlvin, Bethlehem Shipbuilding Corp., Quincy, Mass., who spoke on large bronze castings; Eli Portman, Stillman-White Foundry, Providence, R. I., who discussed use of chills; Dan Sutherlan, Somerville Machine & Foundry Co., Somerville, Mass., who recommended a vacuum test unit for detection of gas; and Frank Tibbetts, Wollaston Brass & Aluminum Foundry, Wollaston, Mass., who talked about monel-nickel castings.



Some of the representative foundry groups attending the New England Regional Foundry Conference are shown above. Left to right, top: Pioneer Foundry & Mfg. Co., and Production Pattern & Foundry Co. Bottom: Grinnell Corp., and Seaboard Foundry Inc. Photos by courtesy C. A. Wyatt, Debevoise-Anderson Co.

NOW AVAILABLE IN MANY SIZES

DIAFORM PRESSURE
MOLDING MACHINES
The new Taccone Diaform Molding Machine is now being built in sizes from 12 x 18 to 48 x 60 inches. Machines are in daily use in steel, gray iron, malleable and non-ferrous foundries. Details available on request.

We have obtained reprints of *"Molding Sand Symposium"* which appeared in the November issue of FOUNDRY— and invite you to write us for a complimentary copy.

MINERALS International CHEMICALS

EASTERN CLAY PRODUCTS DEPT.

INTERNATIONAL MINERALS & CHEMICAL CORPORATION, GENERAL OFFICES: 20 NORTH WACKER DRIVE, CHICAGO 6

MAN-TO-MAN

By RALPH L. LEE

Variables Unlimited

"In the foundry business, clean-cut answers are rarer than hen's teeth; there are more exceptions to rules than there are rules themselves"

OLD Grandpa Lee (that's my molder Grandpa, on my Pa's side!) was quite a character. I only hope that my grandchildren will remember me with as much admiration and affection as I have for him. But as much as I thought of him, he had one habit I couldn't understand.

Whenever I asked Grandpa whether something I had heard about molding was so or not, in all likelihood he'd come back with something like this, "Well, Son, I'll tell you—I'd say i' tiz and i' taint. Now you take on the one hand, you might have this; but then agin, on the other, you could have that."

Being used to having adults give me snappy, clean-cut answers to my questions, I couldn't understand why Grandpa sashayed back and forth around questions I knew darned well he could answer if anyone could.

It dawned on me the other day, after all these years, why Grandpa tizzed and tainted me. It was because he was in the foundry business, that's why—where clean-cut answers are rarer than hen's teeth, where there are more exceptions to rules than there are rules and where, in a pinch, two wrongs are forced to make a right.

It's the variables in this old foundry business of ours, I guess, that make it so interesting; not only the number of variables, but the wide range of each.

John Linabury, one of the pioneers of the mechanization of the automotive foundry and a frequent visitor to the Lee Hobby Foundry, chuckled when I sprung the idea of this article on him. He recalled how the head of one of the General Motors foundries had just got through telling some of his pals from other GM foundries that he used a certain hard coke to make hard iron and was knocked for a loop when another foundry head came right back with, "Why, I use that hard coke to make soft iron!" John went on to say that they both were right as far as coke was concerned, but differed in other regards they failed to mention.

As foundry consultant for all General Motors foundries, John was in a position to hear equally illustrious and time-proven foundrymen argue until they were black in the face from diametrically opposite viewpoints and with good results as proof to back them up.

During this past month I have made between 300 and 400 tests on the tensile strength of molding sand in relation to the moisture content, using a method and apparatus I concocted myself. It's been very interesting. With a sample of automotive system sand of given bond and additions, with set moisture content, I have played the range of ramming pressures, with interesting results in terms of tensile strength.

I also played a tune on differently sized specimens rammed at a given ramming pressure, with set moisture, to see how flowability affected tensile strength. The need for a more accurate and reproducible moisture content measure threw a monkey wrench into the works, making it necessary for me to rebuild and recalibrate my moisture tester. (Boy it's dead nuts now; with some exaggeration, I believe I could almost measure the difference in weight between a dry and wet footed mosquito!) The natural evaporation of the peewee moisture content of this synthetic sand during tests also gave me a run for my money. By the way, this little problem made me wonder what happens in big foundries in the long trips from the mullers to different stations along the way.

With sand specimens of a given size, rammed at given pressures, it was quite a revelation moving from almost bone dry sand (2.2 per cent) on up the moisture scale to practically mud (6.3, synthetic). The only point I want to make in talking about this project as far as it has gone is that there appears to be more than one way to skin the cat as far as sand strength is concerned, even with a given sand, given bond and additives.

I begin to see why sincere argument is bound to be the result of proven foundrymen getting together and why old Grandpa Lee tizzed and tainted so much.

Even as an amateur foundryman with loads to learn about the business I also begin to see why anyone once bitten by the foundry bug will never feel fully contented in any other line of work. It's because of the loopholes left by all of these variables for the licking of foundry problems, in your own peculiar, personal and inimitable way.

Every step of the way down the long, zigzag trail from pigs, ingots and scrap to the finished casting is dogged with variables, great and small and ever-changing; that's the nature of this business, I guess. It's the foundry norm. This being the case, it seems to me that in spite of our dreams or hopes, there isn't much likelihood of ever finding some new and remarkable innovation with the power to pull rabbits out of hats for us.

At the last foundry meeting I attended—and a most interesting one to me—slides were shown (without a speech) of every type of molding machine I had ever seen or heard about. Then a presentation was made of a new diaphragm squeeze molder, with most enthusiastic claims and promises. Rest assured that I took particular interest in this subject—in fact, paternalistic pride, having as far as I know pioneered in this field.

Then one of the most realistic and factual of reports was given on the status of the shell molding process. Even though the gentleman making the presentation operated a foundry devoted exclusively to shell molding, he made the point that this process got off to a bad start by too much ballyhooing and panacea claiming. He had great confidence in the future of the process for specific types of castings, provided everyone involved would pitch in and help with the variables.

He very definitely cautioned us to be wary of precision in the low decimals, but felt quite sure that with green sand molding still quite safe

(*Concluded on page* 168)

protect your profits with

APEX ... Z-50

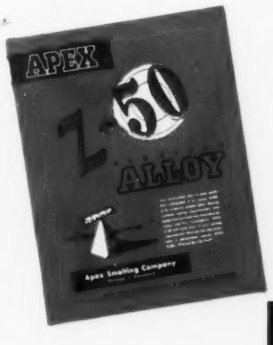
ALUMINUM ALLOY

QUALITY AND ECONOMY
tested and proved on the job

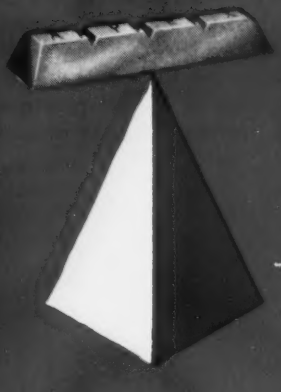
Above average mechanical properties, uniform casting characteristics and free machinability make Z-50 aluminum alloy developed by Apex an outstanding money saver on your production line.

Fulfilling the foundry's need for a quality all-purpose alloy, Apex Z-50 polishes and buffs to a satin finish, has excellent response to anodizing and other chemical and electrochemical finishes. Its as-cast properties are right for most castings, it may be treated for highly stressed castings, and it provides superior dimensional stability with an aging treatment.

Apex Z-50 is another superior product of Apex research and scientifically controlled production, tested and proved in the foundry field and in final application.



Send for your copy of Apex Z-50 folder showing composition, physical properties, and permanent mold and sand cast mechanical properties.



Research leadership back of every ingot

APEX SMELTING COMPANY

CHICAGO • CLEVELAND • LOS ANGELES

(*Concluded from page* 166)

for a long time to come, shell molding had a definite place where close tolerances and ultrafinish could carry the burden of higher costs.

I really do have a point in this patchwork quilt. It's this: Hounded by variables to a greater extent than almost any other branch of industry, foundrymen naturally try not only to corral these variables, but to seek short cuts around them. As an amateur kibitzing from the other side of the fence, I get the feeling that foundrymen are a little more gullible about the siren call of gilded-lily claims than other businessmen. Maybe what's needed when considering some excitingly new offering is to separate the things we wish were so from the things we have heard are so and move with caution on the basis of what we know darned well is so, keeping constantly in mind the variables that are always with us.

Contract Ending Explained

Large savings in time and work for prime contractors, subcontractors and suppliers is expected to result from the use of a new pamphlet recently issued by the Chamber of Commerce of the United States to serve as a guide through the confusion and inconsistencies of government contract termination settlement. The 60-page booklet takes the reader step by step through the termination process. Chapters are included on initiating termination action, steps preliminary to submission of claims, disposition of termination inventory and settlement procedures. Priced at $1, the guide may be obtained from the Manufacture Department, Chamber of Commerce of the U. S., 1615 H St., N.W., Washington 6, D. C.

WILLIAM B. COLEMAN SCHOLARSHIP ESTABLISHED

At Penn State by Philadelphia Chapter, AFS

PHILADELPHIA Chapter, American Foundrymen's Society, has established at Pennsylvania State University the William B. Coleman Scholarship Award in recognition of Mr. Coleman's outstanding service to the foundry industry. Awards will be made annually to a senior student enrolled in industrial engineering, mechanical engineering or metallurgy.

The scholarship was announced Oct. 8 at a regular meeting of the Philadelphia chapter by Clyde B. Jenni, General Steel Castings Co., Eddystone, Pa. Its purpose is to recognize the services of Mr. Coleman to the Philadelphia chapter and the foundry industry generally; to help worthy students acquire an engineering education, and to contribute to the development of foundry science and technology.

The scholarship offers an annual award of $500; half is given to the recipient at the beginning of his senior year and the other half at the start of the second semester.

To be eligible for the award an applicant must be registered as a full time student of Pennsylvania State University in industrial engineering, mechanical engineering or metallurgy. Applications, obtainable from the university, should be submitted to the university's Committee on Scholarship and Fellowships of the College of Engineering and Architecture. Applications for any academic year must be submitted not later than the preceding Mar. 1.

Awards will be based on: Past academic achievement as shown by the student's rank in upper two-fifth's of his class; desirable personality and character traits; evidence of leadership; participation in extra-curricular activities; past association with and interest in the foundry industry, and financial need. Four students will be nominated

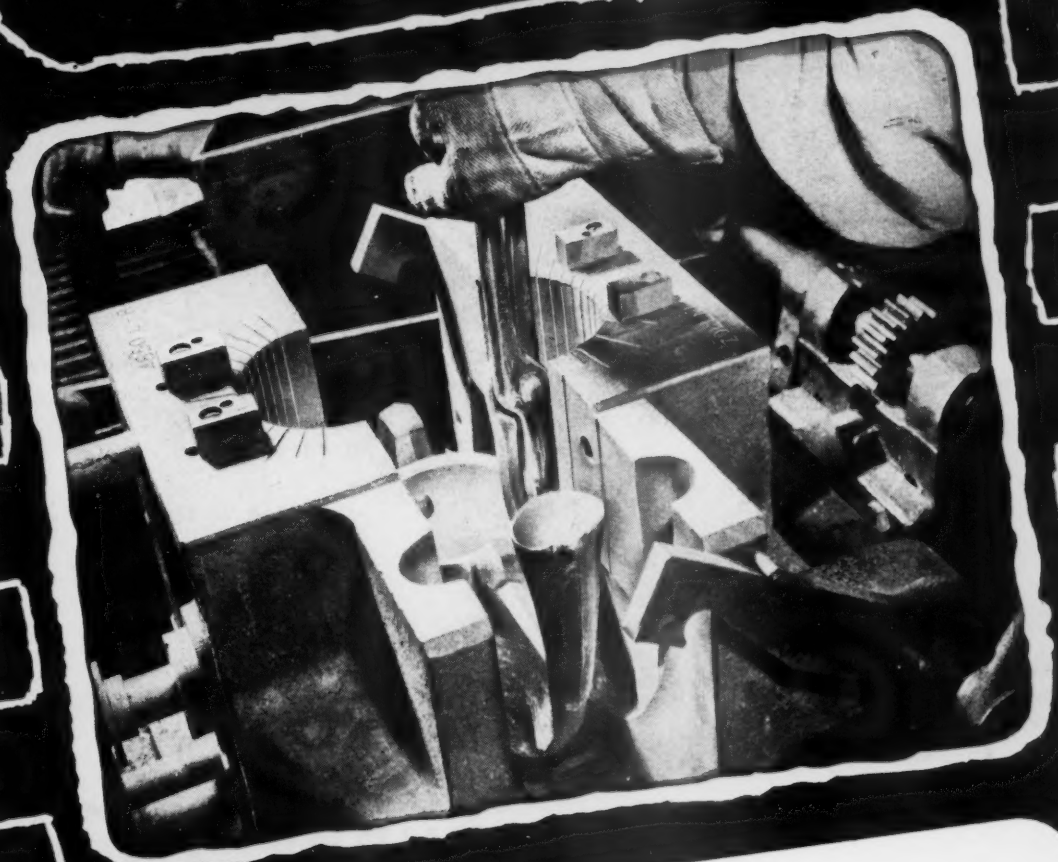
William B. Coleman is president of W. B. Coleman & Co., chemical and metallurgical consultants, Philadelphia. He was first chairman of Philadelphia Chapter of the AFS and currently is secretary-treasurer. He has devoted more than 20 years to chapter service. A University of Pennsylvania graduate, Mr. Coleman's first commercial experience was in the laboratories of Midvale Steel Co. Subsequently he was transferred to the open hearth department and in 1915 was made superintendent of open hearth furnaces. He was sent to the Coatesville plant in 1916 where he evolved a process for making shell steel.

In 1918, he became superintendent, Tacony Ordnance Corp., serving at the same time as civilian consultant, ordnance department, Washington, on the manufacture of steel for gears. After the war, Tacony Corp., was absorbed by Penn Seaboard Corp., and Mr. Coleman remained as general superintendent of that plant until 1922 when he organized his own company.

In addition to his foundry society activities, Mr. Coleman is a member of the American Chemical Society, American Institute of Mining & Metallurgical Engineers, and the American Society of Metals, of which he is a past president.

William B. Coleman, left, president, William B. Coleman Co., Philadelphia, is shown accepting from Clyde Jenni, General Steel Castings Co., Eddystone, Pa., the formal acknowledgement of a scholarship award established in his name at the Pennsylvania State University by the Philadelphia Chapter of the American Foundrymen's Society. Photo courtesy of Leo Houser, Dodge Steel Castings Co.

telling the story of 'dag' dispersions



Dry-Film Mold Wash Solves These Foundry Problems

1. Prevents Sticking—A 'dag' Colloidal Graphite mold wash prevents sticking because it forms a micron-thin, exceptionally slippery, *dry lubricating film*. It speeds parting and assures smooth castings.

2. Goes On Easily—'dag' dispersions can be applied by spraying, painting, or dipping. Use them as parting compounds for permanent-mold casting and die casting . . . on molds, patterns, chills, cores, push pins, shoulder screws, flask pins, and ladle interiors. Parting will be quicker, castings smoother. Binding and stripping will be eliminated. Chills will tap off easily.

3. Works Without Smoking—Water dispersions of 'dag' Colloidal Graphite improve shop conditions by eliminating irritating smoke caused by most parting compounds.

And if you want to avoid chilling, use a 'dag' refractory mold wash.

You can learn more about 'dag' parting compounds by writing *today* for Bulletin No. 425-M3.

Dispersions of molybdenum disulfide are available in various carriers.

We are also equipped to do custom dispersing of solids in a wide variety of vehicles.

dag DISPERSIONS® **Acheson Colloids Company, Port Huron, Mich.**

. . . also ACHESON COLLOIDS LIMITED, LONDON, ENGLAND

try 'dag' resin-bonded dry films for permanent lubrication

Group of visitors on a plant tour at Vittorio Necchi foundry at Pavia

Foundrymen Meet in Florence for

INTERNATIONAL FOUNDRY CONGRESS

By VINCENT DELPORT
European Manager

THE INTERNATIONAL Foundry Congress for 1954 was opened in Florence, Italy, on Sept. 20, in historical "Palazzio Vecchio." The opening meeting was honored by the presence of a representative of the Italian government, and the mayor of Florence took the chair.

In an address in which he welcomed the members from many countries who attended the congress, the mayor referred to the many works of art created by men of genius whose inspiration took solid form thanks to the art of founding.

Aldo Dacco, president of the Italian Association of Metallurgy, then explained the objects of the congress, which was held under the auspices of the International Committee of Foundry Technical Associations and the patronage of the president of the Italian Republic. The Centro Fonderia, the self-contained foundry section of the Association of Metallurgy, was responsible for the organization, with its president, Dr. Raoul Dupuis.

Mr. Dacco then asked A. Brizon, past president of the Association Technique de Fonderie of France and president of the International Committee, to address the meeting on behalf of the foundrymen of all the nations represented, and he presented Mr. Brizon with a replica in gold of the congress badge.

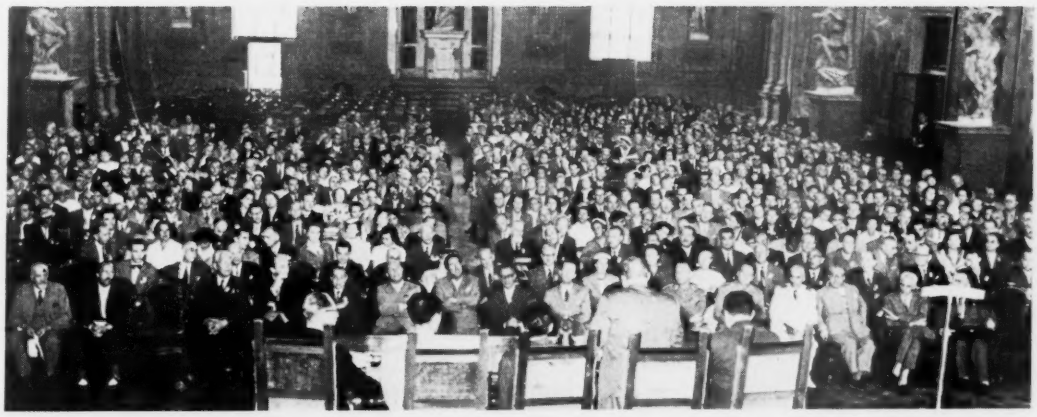
On behalf of the International Committee, President Brizon conveyed thanks to Mr. Dacco, Dr. Dupuis and the Italian officials present, and expressed his conviction that the congress would be a success. He mentioned that over 500 foundrymen from 21 nations were attending.

Representatives of the American foundry industry included C. V. Nass, Beardsley & Piper Division of Pettibone Mulliken Corp., A. P. Gagnebin, International Nickel Co., and Vincent Delport, FOUNDRY.

President Brizon referred to how the accelerated progress of science and development of technique in recent years made it almost impossible for industrial executives to keep in step and had compelled technicians and engineers to specialize in certain fields.

International congresses, said Mr. Brizon, help to spread the knowledge of developments in the foundry industry. He suggested that the action of the International Committee should be strengthened, especially in regard to one of its main objects, the free exchange of information, both printed and spoken.

He gave a brief history of the institution and expansion of the International Committee, of which, on that date, the foundry technical societies of 16 nations were members. He referred to the work done by the international subcommittees on testing cast iron, on foundry defects and on the international dictionary of foundry terms. Although real results had been achieved, the work of these subcommittees made slow progress



Congress was opened on Sept. 20 at this meeting in the Hall of the 500, in Palazzo Vecchio, Milan

Order of Merit of Italian Republic is presented to President A. Brizon by a representative of the government. Aldo Dacco is in the center

A view of members of the International Committee on Testing Cast Iron

Mayor of Florence welcomes delegates at the opening meeting. Shown left to right are: Dr. Raoul Dupuis; the representative of the Italian government; the mayor of Florence; Aldo Dacco and Achille Brizon

President A. Brizon presents the Award of the International Committee to Commandatore Mario Olivo, left. On the right is Professor Albert Portevin

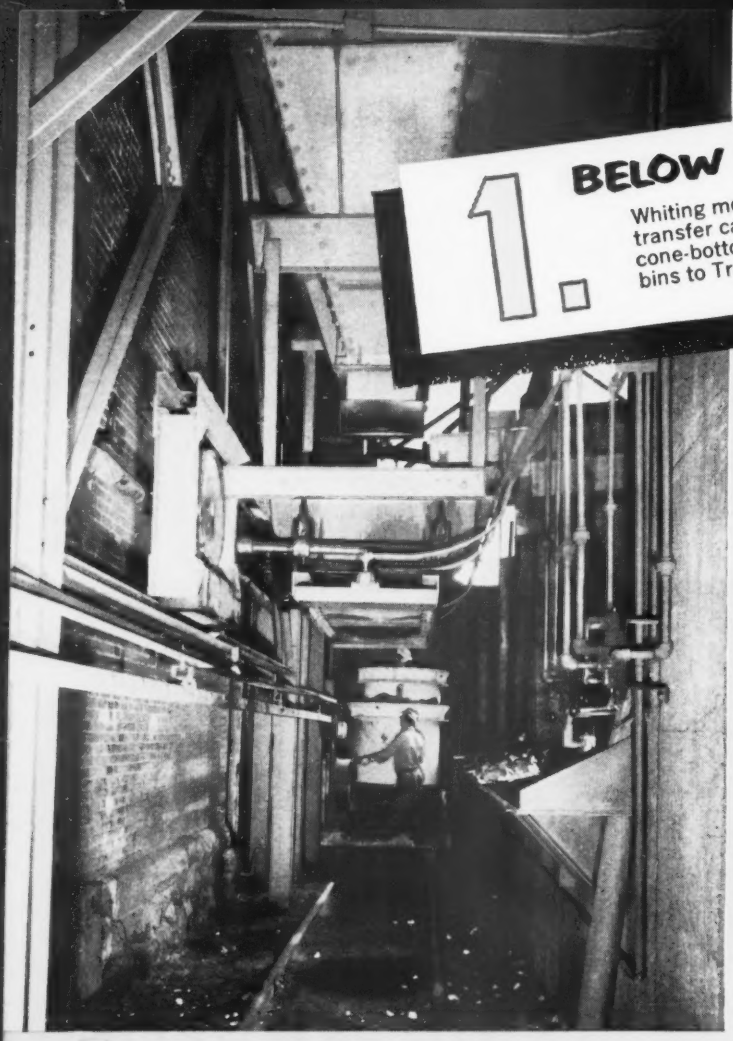
owing to a shortage of time and the inevitable infrequency of meetings. Yet, he thought that further subjects could be studied by international committees. In order to stimulate and guide the activities of the International Committee, Mr. Brizon suggested the formation of a steering committee of past presidents to act as an advisory body to the main committee and maintain continuity in the Committee's work.

President Brizon concluded by saying that the foundry industry justifiably could boast of giving other industries a fine example of organization and co-operation.

The representative of the Italian government, from the ministry of Commerce and Industry, followed President Brizon with a short address of welcome to the delegates and presented Mr. Brizon with the insignia of an officer of the Order of Merit of the Republic of Italy.

The meeting then adjourned; technical sessions began in the afternoon and continued throughout the week,

(*Continued on page* 174)



1. BELOW DECKS

Whiting motor-operated transfer car carries loaded cone-bottom buckets from bins to Trambeam charger.

COOPER-BESSEMER GETS

Team Action

IN MAKE-UP, CHARGING AND MELTING!

Here's how "team action" serves the foundry of Cooper-Bessemer Corporation, Mount Vernon, Ohio. A Whiting-engineered material handling and charging system assures a *fast, smooth flow of materials* . . . a Whiting cupola provides *economical melting*. Increased efficiency at lower cost is the important, overall result!

Here's how their system works: A Whiting 10-ton overhead yard crane with electrically operated bucket and magnet moves all raw materials—scrap, coke and stone—to storage bins. Then charges are weighed in batch hoppers and discharged into Whiting full cone-bottom charging buckets. After being loaded, buckets move on a Whiting motor-operated transfer car to a Whiting Trambeam cab-operated monorail charging crane which lifts the loaded bucket to the charging opening in a Whiting Cupola.

The entire operation requiring only *three men per shift*—crane operator, Trambeam charger operator and transfer car operator—makes possible a capacity of 75 tons per day at a lower cost per ton. Every foundry, large or small, can reduce its costs and increase capacity with a Whiting-engineered charging system. Talk it over now with a Whiting engineer . . . *it will pay off quickly!*

WHITING CORPORATION

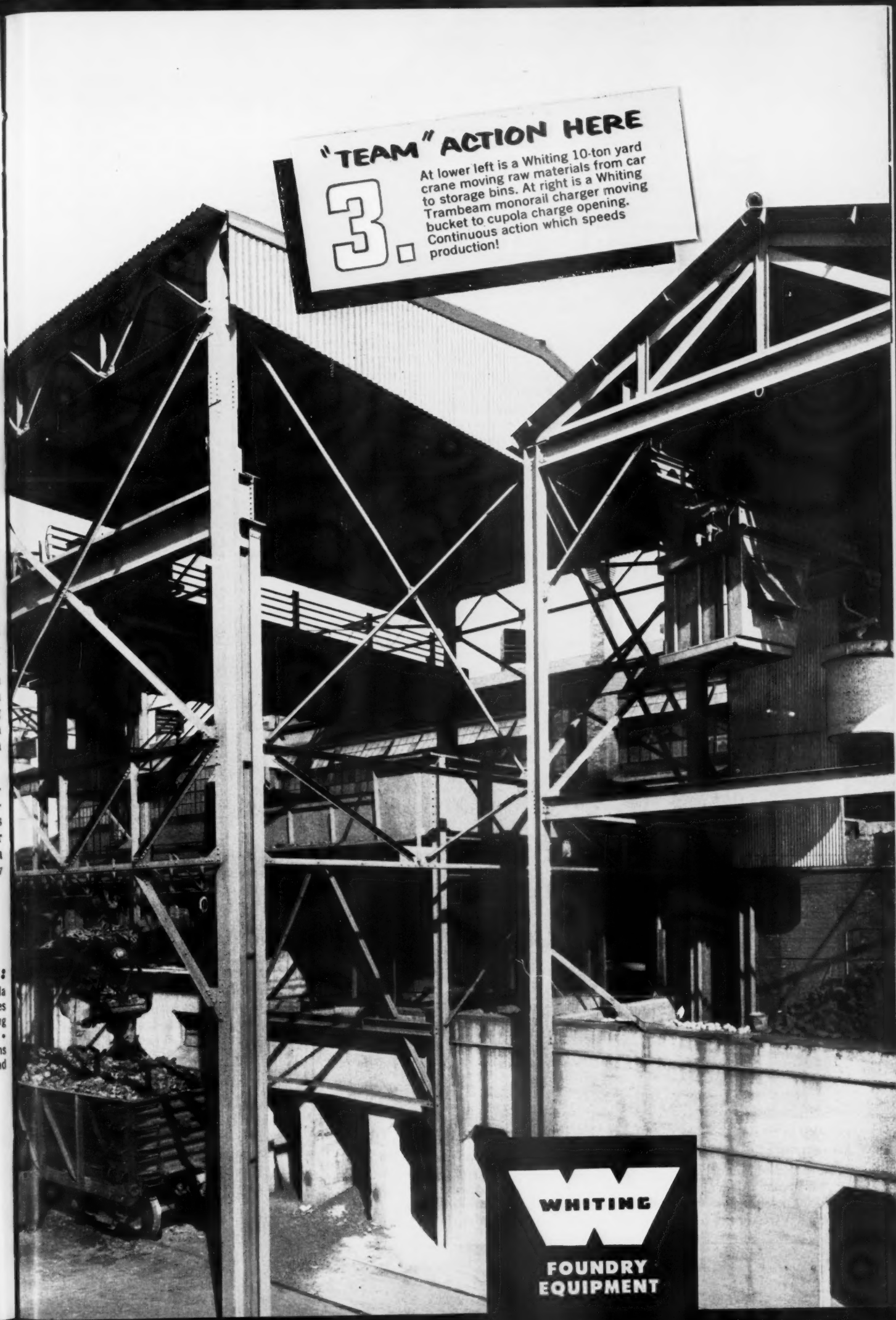
15607 Lathrop Avenue, Harvey, Illinois

WHITING FOUNDRY PRODUCTS INCLUDE:

Cupolas • Cupola Spark Suppressors • Cupola Hot Blast Equipment • Cupola Blast Moisture Control Equipment • Cupola Charging Systems • Cradle Furnaces • Hot Metal Mixers • Duplex Melting Systems • Air Furnaces • Electric Melting Furnaces • Ladles • Ladle Handlers • Ladle Preheaters • Tumbling Mills • Annealing Ovens • Transfer Cars • Pulverizers • Pulverized Coal Firing Systems • Turntables • Electric Traveling Cranes • Trackmobile • Trambeam Overhead Handling Systems • Electric Chain Hoists.

2. UP AND OVER

Whiting Trambeam monorail charging crane, cab-operated, lifts buckets from transfer car, moves them in seconds to charging opening of a Whiting No. 6 cupola.


"TEAM" ACTION HERE
3.
At lower left is a Whiting 10-ton yard crane moving raw materials from car to storage bins. At right is a Whiting Trambeam monorail charger moving bucket to cupola charge opening. Continuous action which speeds production!
WHITING
FOUNDRY EQUIPMENT

(*Continued from page* 171)

interspersed with works visits. Simultaneous sessions were held in three separate rooms. A full meeting of members of the congress, held on Wednesday morning, Sept. 22, was devoted especially to the commemoration of Italian foundrymen who had made outstanding contributions to the progress of the industry. On this occasion, G. Somigli, secretary of the congress, addressed the meeting on the work of Cesare Brunelli who, among other contributions, invented the Italian strainer.

Cesare Brunelli, who died in 1940, devoted many years to the study of foundry problems, particularly those concerning the pouring of castings. In 1896, he published a pamphlet which described his new system of pouring, applicable to any ferrous casting. By the use of a series of strainers, Brunelli obtained a regular flow of metal, yet retained impurities. Using blind heads, he often managed to reduce the size of feeders and risers, obtaining sound castings without churning the metal. Mr. Somigli stated that the system of strainer pouring developed by Brunelli has been adopted universally.

Mr. Somigli and Mario Olivo also mentioned the following other leading Italian contributors to foundry progress:

Aurelio Aureli, who distinguished himself in the manufacture of cast iron pipe and took a leading part in the editing of the Italian technical dictionary of foundry terms.

Dr. Ing. Massimo Barigozzi, who maue a special study of cupola operation and contributed greatly to the development of the foundry center of the Italian Association of Metallurgy, as secretary of the center.

Dr. Ing. Roberto Monti, who, through his researches on the recovery of iron from used foundry sand, enabled the Fiat foundry to recover 3000 tons of iron. He was a vice president of the Italian foundry society and author of many papers.

Dr. Ing. Aurelio Possenti, a pioneer of centrifugal casting in sand and author of several important papers.

Prof. Giuglio Sirovich, director of the Institute of Metallurgy of Rome, whose contributions to metallurgy were considerable.

Dr. Ing. Gino Sulliotti, a prominent metallurgist, who developed the formula $C_t + Si = 4.5$ per cent to indicate high resistance iron. He was professor at the Technical Institute of Turin and contributed to the Italian dictionary of foundry terms.

Dr. Ing. Carlo Vanzetti, whose name remains prominent not only in Italy, but in all other industrial nations. He was the first to use the Stassano furnace for melting steel. In 1900 he used oxygen from the electrolysis of water to increase the temperature of steel converters; in 1905 he used a small open hearth furnace for producing steel for castings. He also used the electric furnace for the first time in Italy for melting steel and in 1915 produced castings in special alloy irons. He was one of the first prominent members of the International Committee of Foundry Technical Associations and became its president in 1930. He was awarded the Award of the International Committee by the American Foundrymen's Society at Atlantic City in 1952 (posthumously).

Ing. Enrico Olivo, pioneer in the production of high duty cast iron for castings (in 1887). His improvements to the cupola made possible achievement of sufficiently high temperatures to melt special alloys. He was inventor of the Olivo cupola.

Obtain New Members

Meetings of the International Committee of Foundry Technical Associations and its subcommittees were held Sept. 22 and 23. At the meeting of the main committee, tribute was paid to Tom Makemson, late honorary secretary, who was secretary of the Institute of British Foundrymen.

Applications for membership on the committee had been received from Japan and Finland. The application of the Japanese association was accepted; that of the Finnish group of foundrymen was accepted subject to confirmation of certain details.

Dr. Raoul Dupuis, president of Centro Fonderio, reported that his committee had nominated Commandatore Mario Olivo, chairman of the international dictionary subcommittee, for the Award of Honor of the International Committee. This nomination was approved unanimously. Great Britain then was invited to nominate the recipient of the award for 1955 since the international congress will be held in London next year. Reports of the subcommittees on testing cast iron, on foundry defects and on the international dictionary were presented and adopted.

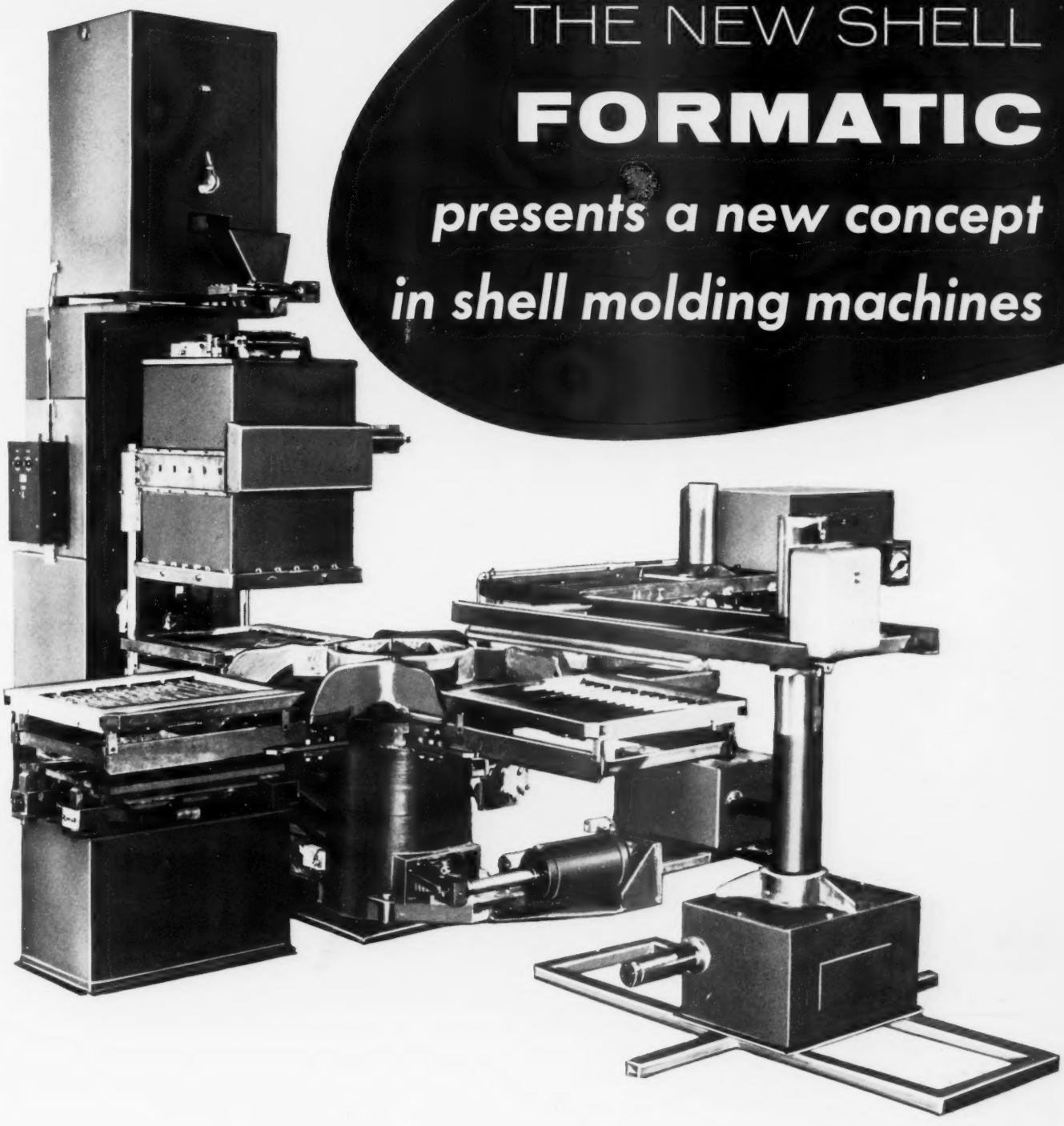
Dr. A. B. Everest, president-elect of the Institute of British Foundrymen, formally invited member associations to attend the international congress for 1955 in London. Arrangements to hold the 1956 congress in Dusseldorf or Essen, Germany, were confirmed by Herr Schwietzke, who said that an exhibition would be staged on that occasion. J. Drachmann, the Swedish delegate, offered to hold the congress for 1957 at Stockholm, and J. V. Bairiot, for Belgium, issued an invitation to hold the congress for 1958 in that country, on the occasion of a world exhibition. These offers were accepted.

(*Continued on page* 177)

ON EXHIBITION: A model foundry sponsored by the Wisconsin Industrial Commission at the recent Wisconsin State Fair displayed the craft and skill of foundrymen to an estimated 50,000 persons who passed through the booth. Aluminum ash trays were cast and given away as souvenirs to lucky number holders. Working equipment, suppliers and manpower for the exhibit were furnished by employers and suppliers in the Milwaukee area

THE NEW SHELL **FORMATIC**

presents a new concept in shell molding machines



Now it's possible for a foundry to make a *modern* shell mold machine installation with an initial investment of only a little more than that required for crude ineffectual dump box equipment. The new B&P shell Formatic machines feature "*unit package*" construction. The foundry starting on their shell molding program can install only those components that are actually necessary. Then they can add units and features as their program is enlarged, and so pay for their shell molding mechanization with shell molding profits.

The simple "*unit package*" components offer all of the important features of the complete rotary unit illustrated. These include fully automatic sand box, curing furnace, and stripper unit controls. The complete automatic rotary shell Formatic unit, incorporating these components, is available for production rates of up to four shells per minute and pattern sizes of 24 x 30 inches and larger. Write today for information. *Beardsley & Piper, Div. Pettibone Mulliken Corp., 2424 N. Cicero Avenue, Chicago 39, Illinois.*

LOOK TO
BEARDSLEY & PIPER
FOR BETTER METHODS

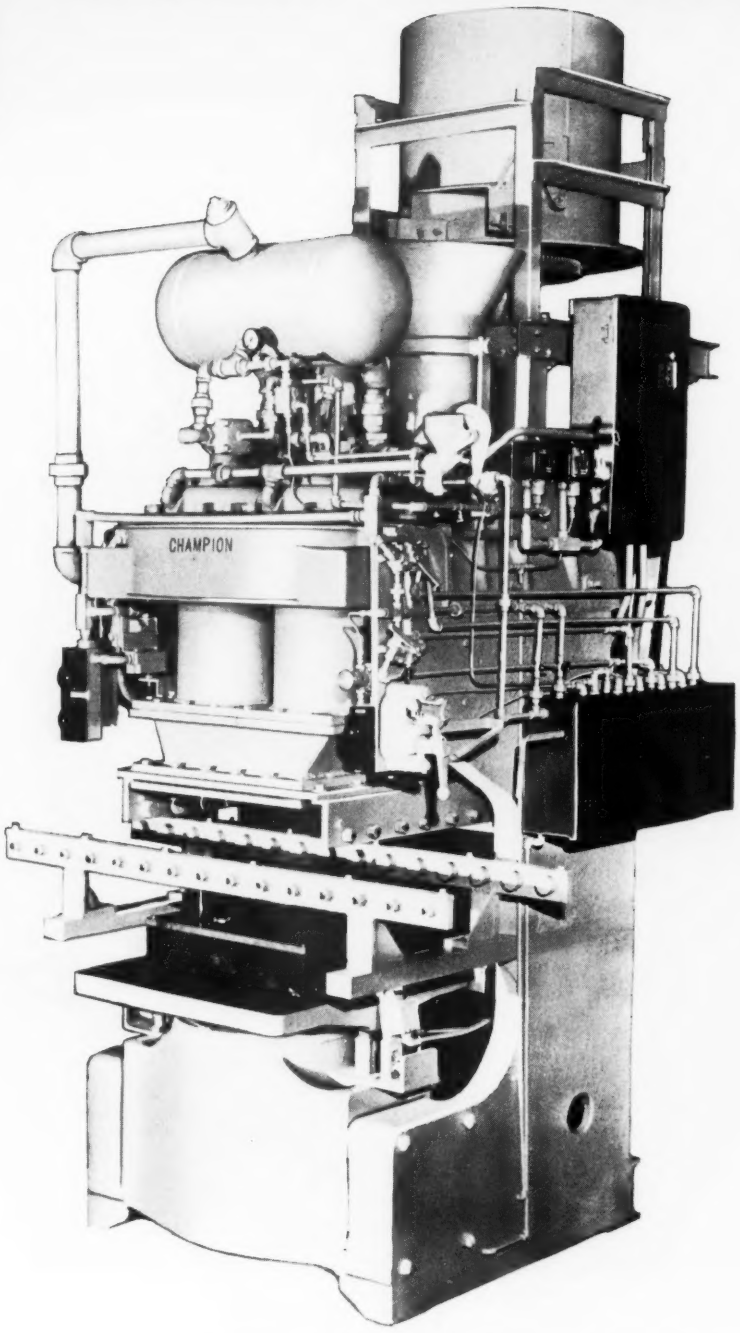
B&P

MEMBER FEMA

new!

B&P MBS-20 MOLD BLOWER

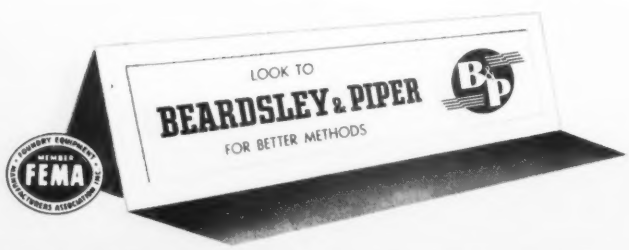
designed for top production of repetitive molds



BLOWS AND SQUEEZES COPE OR DRAG IN A SINGLE AUTOMATIC OPERATION . . . HANDLES UP TO 4 MOLDS PER MINUTE

Designed for those production foundries that must have maximum output of molds from a single pattern, or from several such patterns, the new MBS-20 Mold Blower will outperform any molding machine. Mold sections up to 24 x 36 inches are handled and up to four complete molds can be produced each minute. From the moment the flask is rolled into the machine, until pattern is drawn from the blown and squeezed mold, all operations are fast and automatic. Molds are perfectly uniform and true to pattern.

The MBS-20 is another example of B&P leadership. B&P engineers are always busy seeking out the better method . . . the method that will increase man-hour efficiency and improve the final result. For full data on the MBS-20 write to: *Beardsley & Piper, Div. Pettibone Mulliken Corp., 2424 N. Cicero Avenue, Chicago 39, Illinois.*



(*Continued from page* 174)

On the proposal of President Brizon, Yngve Granstrom, of Sweden, was unanimously elected president for 1955. On the proposal of G. Rivoire, France, it was unanimously agreed to ask Switzerland to nominate the vice president for 1955. G. Lambert, secretary of the Institute of British Foundrymen, was unanimously elected honorary secretary of the International Committee.

The official closing of the congress took place Saturday afternoon, Sept. 25, in the Palazzio Vecchio, and the mayor of Florence presided. Following short addresses by the mayor and by President Dupuis, President A. Brizon thanked the officials and the organizers for the successful manner in which the congress had been arranged and for the many courtesies shown to visitors. He then presented the Award of Honor to Commandatore Mario Olivo.

The meeting closed after the distribution of prizes for the best pictures and sculptures shown at the exhibition. The banquet was held on the evening of the same day and was followed by a dance.

Display Foundry Equipment

A particular aspect of the congress was the exhibition. In addition to the display of foundry plant and equipment, special sections illustrated various aspects and activities of the foundry industry.

In a historical section, originals of ancient books on melting, casting techniques and metallurgy were on display. This exhibit included a copy of the first example of mining and metallurgical legislation, dating from the 13th century. Among other exhibits were a manuscript of La Vita, by Benvenuto Cellini; a 15th century code, "The Palatine Code 814," on melting, refining and testing metals; and many other, later works. An important contribution was made by the Iron Library, a foundation of George Fisher, Ltd., Schaffhausen, Switzerland, which was responsible for saving many valuable historical works on metallurgy from destruction during the last war.

A special subsection was devoted to the work of the international subcommittee on the Dictionary of Foundry Terms. In this subsection, the progress of the work of the dictionary subcommittee of the international committee since its early inception was illustrated profusely.

Another section of the historical exhibits showed ancient objects which illustrated the evolution of founding. This section was organized by the Italian Association of Metallurgy. It included stone molds and castings from the early bronze age; castings and examples of the techniques used by the Egyptians, Greeks and Romans; fragments of statues and tools used by the Etruscans; and small arms, such as daggers and axes, made in an ancient foundry in Bologna in the 7th century.

Among other displays was a head of Treboniano Gallo, of Greek-Roman style, which still shows traces of wax inside the casting. A display of cast iron firebacks and ornaments dating from the 17th century was loaned from Norway and Sweden. Models of old-time foundries also were shown.

One section displayed work done by the associations of various countries to educate young foundrymen and explained the methods of training for higher positions in the industry. Italy, Great Britain, France and Germany were the main contributors to this section. Another section, organized under the patronage of the International Committee on Foundry Defects, showed examples of the work done by the committee. Copies of the albums of foundry defects and of the international album were displayed.

The foundry exhibition proper was divided into two large sections, one showing a considerable variety of castings, the other a display of foundry plant and equipment. Foundries from several countries, including the United States, contributed to the exhibit of castings.

The exposition of foundry plant and equipment was organized by AMAFOND, the Italian association of manufacturers of foundry machinery. Only national products were shown, including some plant items of foreign origin manufactured under license. Fifty-two firms took part.

About 3000 companies in Italy operate foundries and produce die castings and light alloy castings. Only about 100 employ more than 100 workers. The others are small foundries and in some cases depend mainly on craftsmen. The greater part of the independent companies are jobbing foundries. Although they cannot apply methods of mass production, they endeavor to improve product quality and to increase productivity. In these efforts, they have been given much help by teams of American consultants through American aid.

The lack of good natural molding sand has caused remarkable development in applications of synthetic sands. Use of correctives and additions to the cupola also has been extensive because of the variety of production in any one foundry and because raw materials do not always show the same characteristics. Size of cupolas used in Italy is limited by the requirements of the country; capacity rarely exceeds 6 tons per hour. Italy has made great strides in the development and use of electric melting furnaces.

The design of molding machines also is governed by these special conditions. Owing to the diversity of products, all-purpose machines are the main requirement.

Visit Several Foundries

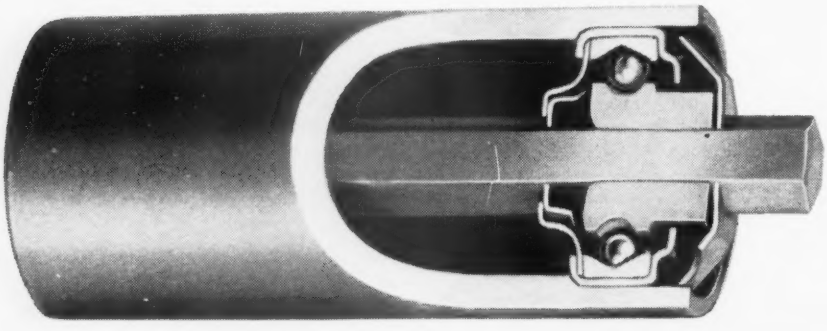
Arrangements had been made to visit foundries during the week of the congress and on three post-congress tours. Foundries generally answered to the conditions mentioned earlier in this report: Production was varied and not particularly adaptable to wholly mechanized methods. Among the iron foundries visited, at least one produced Meehanite castings, and some cast nodular iron. Thanks largely to the influence of the productivity teams and to the counsels of American experts, made available through American aid, progress in efficiency was noticeable, despite a certain amount of resistance due to communistic influence, which is far from negligible in industrial Italy.

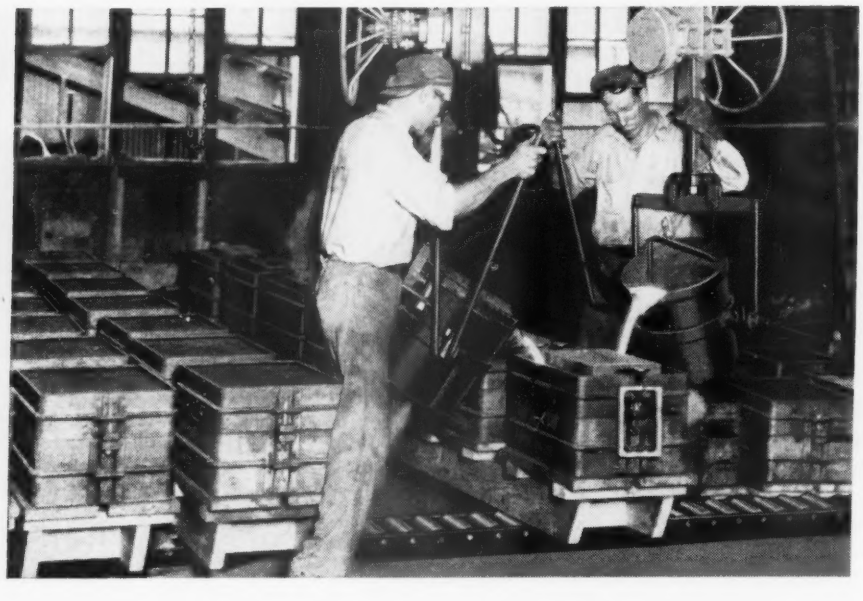
Three foundries visited were noteworthy for their production and efficiency methods, obtained by the use of good planning and of the most modern types of equipment, part of which carried the label showing American contribution to reconstruction.

The foundries of Acciaierie e Ferriere Lombarde Falck, the second largest iron and steel concern in Italy, are located at Sesto S. Giovanni, at the outskirts of Milan. The iron foundry produces 1500 tons per month of ingot molds and equipment for steelworks. The steel foundry pro-

STANDARD'S SHIELDED BEARINGS

Are Expressly Designed for Foundry Conveyor Service





Every Standard roller conveyor is equipped with specially designed bearings that provide the maximum of protection and durability in foundry service. Spillage of hot iron is guarded against by special steel shields. These convex shaped shields fit into the ends of rollers to repel foreign matter. An exit for small particles is provided by an opening at bottom of shield.

Foundry conveyors are designed and built in their entirety by Standard—in a wide range of sizes, weights and types. You can depend on Standard for the right conveyor for your needs — we have been designing and building foundry conveyors since 1906.

STANDARD CONVEYOR COMPANY
General Offices: N. St. Paul 9, Minn.
Sales and Service in Principal Cities

Engineered Conveyor Systems • Portable Conveyor Units • Spiral Chutes • Pneumatic Tube Systems

Send for Standard's special catalog "Conveyors for Foundries" — a valuable reference book illustrating and describing conveyor installations in leading foundries.

Standard
GRAVITY & POWER
CONVEYORS

ENGINEERED FOR LOW-COST PRODUCTION

duces 500 tons per month, of which 200 tons are machine molded; output of the steel foundry includes castings in alloy and stainless steel. Steel castings up to 60 tons can be produced.

Iron is produced in electric furnaces and is used directly in the foundries. Steel is supplied from electric furnaces of 1½, 3, 6, and 25-ton capacities. All furnaces are equipped with automatic regulation.

Each foundry has its own sand preparation plant. The iron foundry uses two grades of natural sand, one for backing and one for facing. The sand preparation plant in the steel foundry is equipped to treat either natural or synthetic sand. A rotary furnace dries sand. The sand mills operate in a continuous cycle. In each case, used sand moves from the shakeout stations on an underground belt conveyor, and overhead conveyors bring molding sand to the molding stations. Capacity of the sand plant in the iron foundry is 12 tons per hour; in the steel foundry, capacity is 20 tons per hour.

Use Many Machines

Large molds are filled by a sand-slinger, and at present molding machines are used for medium and smaller molds. New molding machines are to be installed, including a 15-ton jolt machine for ingot molds. A roller conveyor system also is to be installed. Two knockout machines are in operation, one having a capacity of ½-ton and the other 15 tons.

Coremaking machines are used for smaller cores. Seven drying ovens are for molds and three for core drying. Cleaning of larger castings is by Hydroblast and there are three sand-blast rooms for medium and small castings. Final cleaning is by pneumatic chisels and grinding wheels. Steel castings are annealed in three natural gas-heated furnaces. The foundries have chemical and sand testing laboratories where sand tests are made according to AFS standards.

The foundry of Vittorio Necchi, s.p.a., at Pavia, is one of the most modern of its kind in Europe. Established as a foundry in 1845, the firm became active in 1919 in the field of sewing machines. Today it supplies the greater part of the home market and exports to 78 countries.

Productive capacity is 1200 tons per month. Production lines are synchronized and embody the latest systems of mechanization. Output is divided into three parts: 1. Malleable iron for parts for automobiles, motorcycles, scooters, railroad cars, electrical equipment, etc.; 2. Ordinary

and special gray iron castings for the company's sewing machines; 3. Nodular iron.

The whole production is controlled, and fully equipped laboratories are in operation.

At Milan, a visit was arranged to Fonderie Acciaierie Milanesi Vanzetti. This foundry was founded by Carlo Vanzetti, and the traditions established by the founder and his son Guido are being maintained by the present managing director, Mr. Vio. The foundry produces steel castings by the Randupson cement process and keeps continually abreast of all latest developments.

Congress members who took part in the tour to Rome were received in private audience at the Vatican by the Pope, who gave a concise but well informed review of founding from 300 B.C. to the present day. The Pope referred to the audience he gave to the American delegation who attended the International Congress in Paris, in 1953, and he reiterated his plea for human understanding between employers and workers.

Summaries of papers presented at the congress will be published here next month.

Book Tells How To Cut Load on Management

"The Load on Top Management—Can It Be Reduced?" is a recently published expansion of remarks made by Lt. Col. L. F. Urwick, British industrial consultant, at the European Management Conference held in October. The booklet analyzes the factors which have increased the load of responsibility and effort called for from top managers in industry, and suggests ways in which they can reduce this load. The 52-page book, published by Urwick, Orr & Partners Ltd., Urwick House, 29 Hertford St., London W. 1, England, is priced at 2s.

Group Membership Grows

National interest in solving materials handling problems in industry and commerce is evidenced by the growth of the American Material Handling Society Inc. The society now has 39 chapters and is aiming for 45 during the coming year. Four new chapters were enrolled during June. National officers are Douglas A. Gillespie, president; Harvey L. Bouwkamp, vice president; Frank G. LaTour, treasurer; J. Wellington Hall, secretary, and Arthur E. Fryer, administrative secretary.

In the forward march of SHELL MOLDING 1954

1947 DUREZ RESINS set the pace!

Production efficiencies available to foundries and their customers through shell molding have depended from the beginning on the phenolic resins used to bond the sand.

Special resins had to be developed. As the largest producer specializing in phenolics exclusively, Durez has been in the forefront of foundry resin development from the beginning. Today Durez resins are widely recognized for their uniform quality, fast cure, and rigid set. All these are key properties in obtaining castings with desired structural strength, dimensional accuracy, and finish.

DUREZ

PHENOLIC RESINS

MOLDING COMPOUNDS

INDUSTRIAL RESINS

PROTECTIVE COATING RESINS

Specialists for 33 years in developing phenolic resins and plastics to meet the needs of industry.

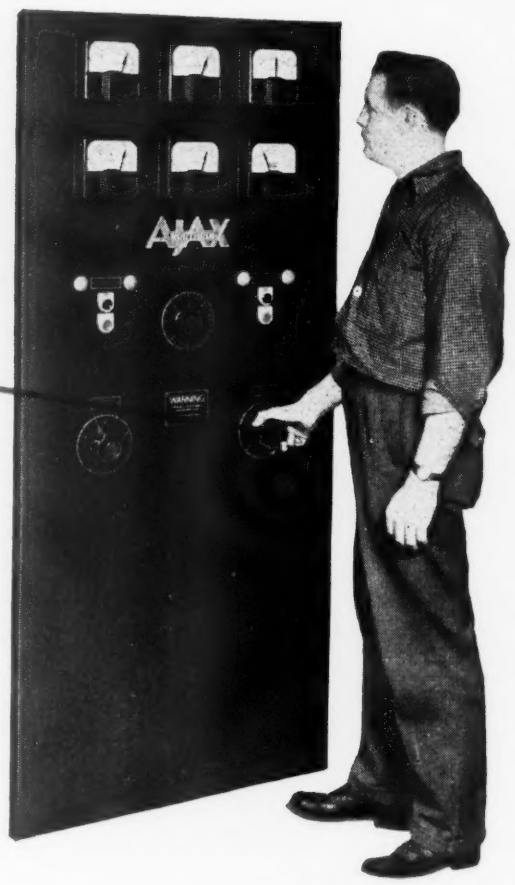
DUREZ PLASTICS & CHEMICALS, INC.
1012 Walck Road, North Tonawanda, N. Y.

You may have decided to look into shell molding — to see how it can profit you. Or as a shell molder you may have questions that can be answered from our experience. In either case, Durez resin technicians are at your service. Just write.

What one foundry's customer says: "We have fewer rejects with these shell molded parts. The product has excellent uniformity—it meets our high standards of density and freedom from air bubbles or spaces that would interfere with electrical conductivity."

Phenolic Resins for the New Competitive Era

COMPLETE CONTROL



makes AJAX-NORTHRUP induction melting...

1. FASTEST
2. MOST PRECISE
3. MOST ECONOMICAL

Consider carefully . . . when an AJAX 50 kw furnace melts steel faster than any other furnace, there must be a difference. There is. Kw for kw, an Ajax-Northrup furnace *always* provides the shortest melting time due to its highly developed, easy-to-operate controls.

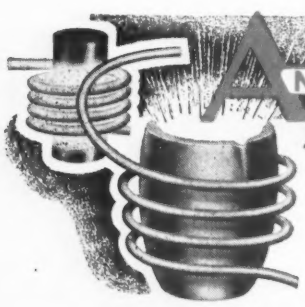
The flexibility of Ajax-Northrup controls permits faster melting because power input can be kept at a constantly high value . . . despite changes in electrical characteristics that occur during the melt. This flexibility also means more precision in casting since pouring temperatures can be maintained exactly as desired.

Ajax-Northrup controls incorporate a rotary power factor switch which is a fool-proof interlocked system. Capacitor steps are conveniently added by single units without guesswork. If any unit is removed, the power supply is automatically opened. Power is likewise controlled by a rotary tap switch adding flexibility to furnace operation. Voltage is controlled by a single rheostat which gives the operator full control from near zero to the maximum rating.

Speed and precision of Ajax-Northrup controls also mean down-to-earth economies in production. Fast melting practically eliminates oxidation and all the foundry losses that go with it. Recovery of alloying elements is consistently high . . . in at least one case, nickel recovery is 100%; chromium 99%; molybdenum 95%. Add these advantages to fewer rejects and easier alloying, then you can realize the extent to which Ajax-Northrup controllability pays off.

We would be pleased to send you descriptive literature. Simply advise us as to the metals melted and the capacity of your melts.

544



AJAX NORTHRUP SINCE 1916

INDUCTION HEATING-MELTING

AJAX ELECTROTHERMIC CORPORATION • AJAX PARK, TRENTON 5, NEW JERSEY

Associated Companies: Ajax Electrometallurgical Corp. • Ajax Electric Furnace Co. • Ajax Electric Company, Inc. • Ajax Engineering Corp.

ACTIVITIES OF FOUNDRY GROUPS

Birmingham

CASCADE Plunge, Birmingham, was the gathering place Sept. 18 for 196 members and guests of Birmingham Chapter of the AFS who attended the chapter's 21st annual outing. Outing was arranged by a committee of W. K. Bach, Henry Guthrie, Jim Minter, Edward J. Warwick and Tom Turner. Guests included G. E. Lunt, Bradley & Foster Ltd., Darlafton, England, and Charles Chisolm and Hal Roach, chairman and secretary-treasurer, respectively, of the Tennessee Chapter of the AFS.

Two panel discussions featured the Oct. 15 meeting held at Tutwiler Hotel, Birmingham. Edwin E. Pollard, Caldwell Foundry & Machine Co., chapter chairman, presided over 83 members and guests.

J. E. Reynolds, chief metallurgist, U. S. Pipe & Foundry Co., was chairman of the ferrous metals panel that consisted of J. R. Cardwell, Stockham Valves & Fittings Inc.; S. F. Carter, American Cast Iron Pipe Co.; A. N. Garrison, Continental Gin Co., and Mark Adkinson, Production Foundries Division, Jackson Industries Inc. Discussion covered basic cupola practice, water-cooled cupola melting and slag control, desulphurization of iron with calcium carbide and the function and placement of flux as it effects slag control.

L. H. Durdin, president, Dixie Bronze Co., served as moderator of the nonferrous panel. Panel members were Bob Jenkins, Stockham Valves & Fittings Inc.; Art Orazaine, Anderson Brass Co., and Al Turner, Dixie Bronze Co. Discussion centered on brass and bronze melting problems. Various types of melting equipment were considered and cost as well as melt quality was discussed. —*J. A. Wickett, U. S. Pipe & Foundry Co.*

Western Michigan

WESTERN Michigan Chapter of the AFS held its first technical meeting of the season on Oct. 4. J. A. VanHaver, Sealed Power Corp., chapter chairman, presided. Henry Laforet, Lakey Foundry Corp., treasurer, reviewed the chapter's favorable financial status. George W. Cannon Sr., past president, Campbell, Wyant & Cannon Foundry Co., spoke briefly on his recent trip through Europe and his visits to many foundries. Horace Deane, Campbell, Wyant & Cannon Foundry Co., technical chairman, introduced the main speaker, Thomas

WESTERN MICHIGAN Chapter of the AFS met Oct. and heard G. W. Cannon Sr., left, past president, Campbell, Wyant & Cannon Foundry Co., relate his recent experiences in Europe and T. E. Eagan, Cooper-Bessemer Corp., right, Speak on "Nodular Iron." Photograph by W. W. Hicks, Sealed Power Corp.

E. Eagan, Cooper-Bessemer Corp., who spoke on "Nodular Iron." Numerous slides were used to illustrate the technical data.—*Wilson W. Hicks, Sealed Power Corp.*

St. Louis

OVER 100 members and guests attended the Oct. 14 meeting of St. Louis Chapter of the AFS to hear Hans J. Heine, AFS technical director, speak on "A New Approach to Improvement of Casting Design." The speaker discussed basic causes of stress concentration, methods of redesigning to reduce these stresses, and directional solidification and its relation to proper casting design. He emphasized the importance of design engineers working with foundrymen to combine engineering needs with those things that enable the foundry to cast the part successfully. Mr. Heine remarked that he thought foundries could regain some of the business lost to other methods of fabrication if emphasis was placed on high mechanical properties in castings, good quality and close dimensional tolerances.—*Jack R. Bodine Jr., Bodine Pattern & Foundry Co.*

Wisconsin

WISCONSIN Chapter of the AFS met Oct. 8 at Hotel Schroeder, Milwaukee, to hear T. E. Barlow, sales manager, Eastern Clay Products Division, International Minerals & Chemical Corp., Chicago, speak on "Pressure Molding with the Diaform Process." Robert V. Osborne, Lakeside Malleable Castings Co., chapter chairman, presided and introduced the speaker.—*John E. Hubel.*

Oregon

CASTING defects, their causes and remedies was the subject of a panel discussion at the Oct. 20 meeting of Oregon Chapter of the AFS, held at the Columbia Athletic Club, Portland, Ore., and attended by 80 persons. Panel members were Ernst Buck, Rich Mfg. Co.; Hal Story, Oregon Brass Works; Herb Tatham, Pa-

OREGON Chapter of the AFS met Oct. 20 and held a panel discussion of casting defects, their causes and remedies. Above, left to right, are panel members Ernst Buck, Rich Mfg. Co., Hal Story, Oregon Brass Works, Herb Tatham, Pacific Steel Foundry, Harry Czyzewski, Metallurgical Engineers Inc., who served as moderator, Vince Belusko, Electric Steel Foundry, Milan Sepich, Western Foundry Co., and Bob Burns, Pacific Chain & Mfg. Co. Each panel member brought one or more castings to be analyzed. Photo by Bill Walkins, Electric Steel Foundry

cific Steel Foundry; Milan Sepich, Western Foundry Co., and Bob Burns, Pacific Chain & Mfg. Co. Harry Czyzewski, Metallurgical Engineers Inc., acted as moderator. Each panelist brought one or more defective castings from his shop and the meeting took the form of a group discussion as the castings were analyzed. Preventive and corrective measures were offered.—*Bill Walkins, Electric Steel Foundry Co.*

Twin City

A PANEL discussion on the C, D, and P processes was the attraction of the Oct. 12 joint meeting of Twin City Chapter of the AFS and American Society for Metals held at Covered Wagon Restaurant, Minneapolis. O. J. Myers, Archer-Daniels-Midland Co., moderated the discussion of newest molding techniques presented by L. J. Pedicini, project engineer, Process Development Section, General Motors Corp., Cadillac Division, Detroit, F. S. Brewster, vice president and general manager, Harry W. Dietert Co., Detroit, and R. W. Heine, associate professor, Department of Mining and Metallurgy, University of Wisconsin, Madison, Wis. A. W. Johnson, Northern Malleable Iron Co., chapter chairman, presided. —*R. J. Mulligan, Archer-Daniels-Midland Co.*

Philadelphia

THE October meeting of the Philadelphia Chapter of the AFS was held at the Engineers Club, Philadelphia and annually will become the "William B. Coleman Night," in honor of Mr. Coleman, long-time secretary-treasurer of the chapter.

The late Lew Lane was recognized for his many contributions to the success of the chapter. Warren Brown, Florence Pipe & Foundry Co., and B. A. Miller, Crown Smelting Co. joined in presenting a memorial plate to Russell Lane, Mr. Lane's son. Clyde B. Jenni, chief metallurgist, General Steel Castings Co., announced the W. B. Coleman Scholarship Award to be given annually at Penn State University. (Details are on page 168)

Daniel Best, superintendent, Brass Foundries, Bethlehem Steel Co., chapter chairman, introduced Frank G. Steinebach, editor, FOUNDRY, who spoke on the "Future of the Foundry Industry." Mr. Steinebach outlined the advances in equipment, procedures, processes and techniques during the past 50 years with some emphasis on the newer molding methods that are finding a place in the industry. The need for better merchandising of the industry and its products was impressed upon the chapter as the real need for the future.

Other needs for future growth were listed as: Increased production to maintain low unit cost; research to develop products and improve quality of present ones; correct pricing to return an honest and deserved profit to the producer; selling the customer on the value of foundry products as opposed to those produced by other methods, and the keeping of the industry in the public eye through promotion.—*Charles R. Sweeny, Atlantic Steel Castings Co.*

Central Ohio

CENTRAL OHIO Chapter of the AFS held its first meeting of the season at Seneca Hotel, Columbus, O., on Oct. 11. Ray Meyer, Ohio Steel Foundry Co., chapter chairman, presided. N. H. Keyser, Battelle Memorial Institute, chapter vice chairman, introduced Dan Krause and Karl Presser, Gray Iron Research Institute, who presented a discussion of "How to Make Good Castings."

Mr. Krause covered casting defects caused by metal and listed wrong analysis, misruns, pin holes, porosity, kish, high sulphur and shrinkage as the major faults. Experimental data on plotting fluidity vs. carbon equivalent were shown. Super heat, gas solubility and elements which tend to increase and reduce nitrogen solubility in iron were treated. Mr. Presser discussed casting defects caused by sand, the effect of moisture on sand properties and pH and gating calculations.—*Eldon Boner, Cooper-Bessemer Corp.*

Ohio State

OHIO State University's Student Chapter of the AFS held its first meeting for 1954-55 on Oct. 5. New officers are George Greenwood, chairman, Herbert Hunt, vice chairman, George Vaughn, treasurer, and Fred Clutton, secretary. Industrial advisers are Paul Eubanks, Ohio Steel Co., Springfield, and Dallas Marsh, Cooper-Bessemer Co., Mt. Vernon. The chapter has 15 members.

Joseph Leaverton, production engineer, James Voss, chief metallurgist, and Al Carpenter, sales representative, Hamilton Foundry & Machine Co., Hamilton, O., showed a film, "Meehanite Means Better Castings," and led a group discussion on the properties, limitations and advantages of Meehanite as an engineering material.—*W. Fred Clutton.*

Central New York

IN SPITE of Hurricane Hazel, 120 members of Central New York Chapter of the AFS met Oct. 15 at Mark Twain Hotel, Elmira, N. Y., to hear T. E. Barlow, sales manager, Eastern Clay Products Department, International Minerals & Chemicals Corp., Chicago, speak on "High Pressure Molding." Joseph Gibson, Sweets Foundry, chapter chairman, presided, with James Ochsner, Crouse-Hinds Co., chapter vice chairman, introducing the speaker.—*Bruce R. Artz, Pangborn Corp.*

Mo-Kan

THIRTY-SEVEN persons attended the Oct. 13 meeting of Mo-Kan Chapter of the AFS at the Fairfax Airport Restaurant, Kansas City, Kans. W. R. Jaeschke, Whiting Corp., Harvey, Ill., spoke on "Cupola Operation." Lloyd Canfield, Canfield Foundry Supplies, chapter chairman, presid-

(*Continued on page* 184)

PHILADELPHIA Chapter of the AFS met in October at the Engineers Club in Philadelphia. Left view, left to right, are Frank G. Steinebach, editor, *FOUNDRY*, featured speaker of the meeting, and Daniel Best, Bethlehem Steel Co., chapter chairman. Right view, Russell Lane, son of the late Lew Lane, accepts a memorial plaque in his father's name in recognition of Mr. Lane's many contributions to the success of the chapter. B. A. Miller, Crown Smelting Co., left, makes the presentation as Warren Brown, Florence Pipe & Foundry Co., right, Mr. Lane's former employer, stands by. Photographs are by Leo Houser, Dodge Steel Castings Co.

Two complete ROTO-CLONE dust control systems occupy only 66 SQ. FT. of FLOOR SPACE

LACK of room is no alibi for not providing efficient dust control. Here's a dual ROTO-CLONE* installation in a large foundry which occupies only 66 sq. ft. of floor space. A Type D of 4500 cfm capacity, located on lower platform, collects snag grinder dust. At top, a Type N of 6000 cfm capacity exhausts abrasive cleaning equipment. Dust and sludge from the two units are discharged through chutes into covered tote boxes at bottom for later disposal.

Every dust collector in AAF's complete line is a space saver. And, with all this compactness, every unit is a high efficiency collector designed for constant exhaust volume and maintained performance over a wide range of operating conditions.

Remember—there is always room for modern dust control. The right equipment coupled with creative engineering thinking is certain to come up with a practical, economical solution. AAF has both. We'd like to prove it in your plant.

**ROTO-CLONE is the trade-mark (Reg. U. S. Pat. Off.) of the American Air Filter Company, Inc., for various dust collectors of the dynamic precipitator and hydro-static precipitator types.*

AAF
herman nelson

American Air Filter
COMPANY, INC.

American Air Filter of Canada, Ltd., Montreal, P. Q. • 266 Central Avenue, Louisville 8, Kentucky

TEXAS Chapter of the AFS met Sept. 17 at the Ben Milam Hotel, Houston, Tex., to hear L. D. Richard, national supervisor of sales and service, Eutectic Welding Alloys Corp., center, speak on "New Developments in Foundry Welding." James R. Hewitt, Hewitt-McGrail Co., chapter vice chairman is at left and Edward W. Wey, Dee Brass Foundry Inc., chapter chairman, is at right. Photograph through the courtesy of William A. Bearden, M. A. Bell Co.

(*Continued from page* 182)
ed. The chapter's 6th annual Christmas party will be held Dec. 3 at Hotel President, Kansas City.—*C. W. Boettcher, Black, Sivalls & Bryson Inc.*

Texas

APPROXIMATELY 75 members and guests of Texas Chapter of the AFS were treated to an informative slide-accompanied talk on "New Developments in Foundry Welding" at the September meeting. L. D. Richard, national director of sales and service, Eutectic Welding Alloys Corp., New York, was the speaker. —*W. A. Bearden, M. A. Bell Co.*

Chicago

FOUR roundtable discussions featured the Nov. 1 meeting of Chicago Chapter of the AFS at Chicago Bar Association with 200 members and guests attending. Robert L. Doelman, Miller & Co., chapter chairman, presided at the general meeting. He announced receipt of a plaque from AFS signifying the chapter as a charter subscriber to the society's newly-occupied national headquarters building, Des Plaines, Ill. Subscribers of $1000 or more were presented with plaques.

The first Robert E. Kennedy scholarship was awarded during the business meeting. Details are given on page 191 of this issue of FOUNDRY.

Malleable and Steel Divisions sponsored a discussion on "The Foreman and the Foundry." Verne Righter, Central Foundry Division, General Motors Corp., Danville, Ill., was the speaker. Chairman and cochairman, respectively, were Edwin J. Jory, Lester B. Knight & Associates Inc., and Paul R. Gouwens, Fahralloy Co.

Nonferrous and Pattern Divisions joined in a session on "Gating and Risering." Panel members included W. B. George, R. Lavin & Sons Inc., E. E. Henry, Hammond Brass Works, and S. H. Ahnell, Woodruff & Edwards Co. D. G. Schmidt, H. Kramer & Co., was chairman. D. Stockberger, Chicago Pattern Works, was cochairman.

"Manufacture and Uses of Bentonite" was the topic for the Gray Iron Division. Arthur Clem, American Colloid Co., and E. W. Claar, Eastern Clay Products Division, International Minerals & Chemical Corp., were speakers. LeRoy Taylor, Geobig Mineral Supply Co., presided.

Maintenance Division focused its attention on "Responsibilities of the Maintenance Superintendent." George H. Glos Jr., Pettibone Mulliken Corp., was the speaker, and E. W. Greenlees, Kensington Steel Co., was chairman.—*Erle F. Ross.*

Pittsburgh

PITTSBURGH Foundrymen's Association began its 58th year on Sept. 20 at the Webster Hall Hotel, Pittsburgh, amid reports the group may soon affiliate with the American Foundrymen's Society. No merger vote was taken at the meeting as the association is awaiting the recovery of H. P. Spilker, chairman of the executive committee, before taking any action. Mr. Spilker has been hospitalized for three months after being hit by a car.

Clyde A. Sanders, vice president, American Colloid Co., Chicago, addressed the group and spoke on sand control and sand binders as related to casting defects. He showed colored slides of fundamental defects, and offered explanations of how gating systems become choked with dirt or entrapped slag accumulating at ingates. Discussion from the floor on a proper formula for construction of a gating system and proper planning of a positive pressure system followed the talk.

About 110 members met for the Oct. 18 meeting to hear a program devoted to refractories. W. H. Owen and F. H. Fanning of the technical department, Harbison-Walker Refractories Co., were the main speakers. Mr. Owen spoke on basic cupola lining and developments in gate and runner brick. Mr. Fanning discussed electric and malleable furnace linings—*Robert Love.*

Central Illinois

RELATIONSHIP of the President and the Sweeper" was the subject of A. A. Agostini, foundry manager, Southwater Division, Grede Foundries Inc., Milwaukee, at the Oct. 4 meeting of Central Illinois Chapter of the AFS. About 150 members and guests attended the meeting at the American Legion Hall, Peoria.

(*Continued on page* 186)

NORTHERN CALIFORNIA Chapter of the AFS met Oct. 18 at the Hotel Shattuck, Berkeley, Calif., and heard A. L. Kreuer, western manager, Orefraction Inc., talk on the "Romance of Zircon." Pictured above, left to right, are Clayton Russell, Phoenix Iron Works, technical chairman, Mr. Kreuer, David Sutch, Brumley-Donaldson Co., entertainment chairman, and John Bermingham, E. F. Houghton Co., chapter chairman. Photo by J. M. Snyder, Joseph Musto Sons

Jones & Laughlin *uses many* Fuller Rotary Compressors

Like many other steel producers and fabricators, from the East to the West Coast, Jones & Laughlin Steel Corporation has purchased and uses many Fuller Rotaries in its various mills. Illustrated above is a Fuller Rotary Two-stage Compressor, having a capacity of 1660 c.f.m. 120-lb. pressure, installed in the P-1-10″ bar mill of the Pittsburgh Works Division.

Endurance, plus efficiency and maintained capacity, flow of air without pulsations, elimination of vibration, are results of the rotary principle employed in the design of the Fuller Compressor. They can be placed on comparatively light foundations, on balconies or upper floors to save valuable floor space and shorten distribution lines. Employing a minimum of moving parts—rotor, bearings, blades—greatly reduces maintenance and eliminates adjustments entirely.

The cylinders of a Fuller two-stage machine are at ground level, mounted on a common base plate, and are connected by a flexible coupling. Installation is very simple, the motor being lined up to the coupling on the shaft extending from the low-pressure cylinder. This arrangement simplifies motor maintenance work as compared with many other types of machines.

Due to extremely low inertia and WR^2, Fuller compressors, which operate in speed ranges of 600 to 1750 r.p.m., according to size, and are directly coupled to the motor, may be installed with either a general purpose or a normal torque synchronous motor, as dictated by size and the electrical requirements of the plant. Standard motors are available for all sizes of Fuller compressors in either squirrel cage or synchronous types.

For full information, write for Bulletin C-5A.

FULLER COMPANY, Catasauqua, Pa.

Chicago • San Francisco • Los Angeles • Seattle • Birmingham

C259
1292

Fuller

PIONEERS OF HIGH-EFFICIENCY VANE-TYPE ROTARY COMPRESSORS

(*Continued from page* 184)

Ill. George Rockwell, planning superintendent, Caterpillar Tractor Co., served as technical chairman and Burton L. Bevis, chapter chairman, presided.

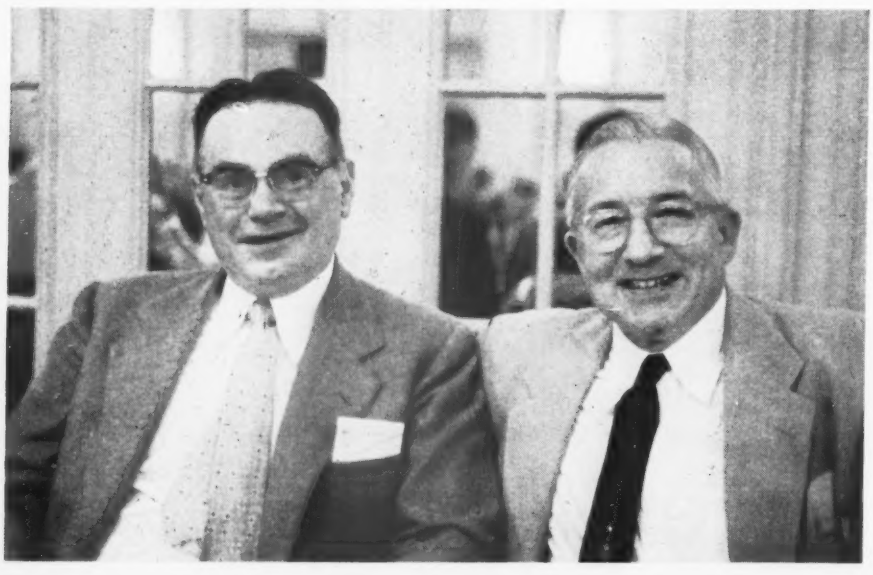
Mr. Agostini spoke of management's responsibility to labor and the importance of maintaining morale within the work group, with an explanation of how this might be accomplished.—*Clarence J. Turner, Caterpillar Tractor Co.*

Northeastern Ohio

NEARLY 200 members of Northeastern Ohio Chapter of the AFS met Oct. 14 at the Tudor Arms Hotel, Cleveland, to honor F. Ray Fleig, Smith Facing & Supply Co., for his 17 years of continuous service to the chapter. He served as director, vice chairman, chairman, and since 1943 has been treasurer. Most of the past presidents were present; others sent congratulatory wires from distant points. Mr. Fleig was presented luggage in recognition of his devotion and service to the chapter, the foundry industry, and the government. He was a member of four committees in Washington in the interest of the foundry industry during World War II and served three terms as president of the Foundry Facings Manufacturers Association.

Technical speaker for the evening, George A. Riley, American Brake Shoe Co., New York, discussed "Safety in the Foundry." To Mr. Riley an accident is an unexpected happening, not planned, that interferes with production. All accidents cost money and should be investigated to eliminate their causes, not to assign blame. The foundation of a good safety program is good housekeeping.

Patternmaking division assembled separately to hear Owen S. Willson, Dougherty Lumber Co., speak about "Woods Used in Patternmaking." Mr. Willson discussed pattern woods, their characteristics and availabilities. He emphasized that wood is a variable natural product and that grading is a visual process subject to human error in judgment.—*Byron E. Kennel and Jack C. Miske.*



NORTHEASTERN OHIO Chapter of the AFS met Oct. 14 at the Tudor Arms Hotel, Cleveland, to hear a talk by G. A. Riley, above left, American Brake Shoe Co., and to honor F. Ray Fleig, for his 17 years of devotion and service to the chapter. Mr. Fleig is at left below with one of his many longtime friends, L. P. Robinson, Archer-Daniels-Midland Co. Photos are through courtesy of Harold Wheeler, Superior Foundry Inc., and Sterling Farmer, Sand Products Corp.

Reading

ANNUAL joint meeting of the Reading and Conestoga Foundrymen's Associations was held Oct. 19 in the Berkshire Hotel, Reading, Pa., with 150 members attending. Prior to the meeting the group toured the Texitile Machine Works plant in Wyomissing. Harry H. Kessler, manager of foundry operations, Sorbo-Mat Process Engineers, St. Louis, was the main speaker and was introduced by Hermann P. Good, technical chairman. Mr. Kessler outlined four areas where economies may be affected—overhead, purchasing and melting of metals, purchasing of other raw materials, and labor.—*William I. Cassidy.*

Southern California

ABOUT 120 members and guests attended the Oct. 15 meeting of Southern California Chapter of the AFS at Rodger Young Auditorium, Los Angeles. William Baer, Casting and Forging Section, Bureau of Ships, U. S. Navy, Washington, and immediate past chairman of Chesapeake Chapter of the AFS, was a guest at the meeting. Speaker of the meeting was A. L. Kreuer, manager, Western Division, Orefraction Inc. His subject was "The Romance of Zircon."

Mr. Kreuer remarked that zircon is not a chill even though it has a chilling action through a property of dissipating heat rapidly. It compares with sapphire in hardness and while it has been used to get better facings on castings its primary use is in refractories as cupola and ladle linings. One zircon-lined steel pouring ladle was reported still in use after pouring 400 heats.

Annual Christmas Party will be held Dec. 11 at Lakewood Country Club, Long Beach, Calif.—*W. G. Stenberg, U. S. Electrical Motors Inc.*

Detroit

FIRST Ladies Night in 25 years of Detroit Chapter of the AFS was held Sept. 24 in the Detroit Leland Hotel, with 210 members and guests attending. Mr. and Mrs. Ralph L. Lee, retired member of the public relations department, General Motors Co., and a contributing editor to FOUNDRY, were honored as the "ideal foundry couple." Frank Reicks, Ford Motor Co., was recognized for his efforts on behalf of the newly occupied AFS headquarters building, Des Plaines, Ill. —*Jess Toth, H. W. Dietert Co.*

Northwestern Pennsylvania

CUPOLA Operation" was the subject of Howard A. Wilder, manager, Iron Foundry Division, Vanadium Corp. of America, Detroit, at the Sept. 27 meeting of Northwestern Pennsylvania Chapter of the AFS. Meeting was held at the Erie, Pa., Moose Club. Bailey D. Herrington, Hickman, Williams & Co., chapter chairman, presided. Mr. Wilder spoke on a variety of aspects of efficient cupola operation and their ef-

(*Concluded on page* 188)

Sand is only part of the picture...

This bird's eye view of a big earthmover in action means progress! And Caterpillar® — maker of the unit shown — is a master at making the word "progress" a reality. Everywhere you go you see these behemoths digging and pushing as they reshape the earth, tons at a time. No small stuff . . . just big.

Now that kind of operation calls for dependability from all components. There's no place for breakdown or faulty parts on such operations. Caterpillar, therefore, is mighty particular about design and engineering . . . about sources of supply for parts . . . about the materials used in the castings they themselves produce.

In this latter instance, Smith L-O Core Oil plays a vital role. Its use has proved conclusively that cores made with this brand of oil help bring about castings that pass the acid test of hard and constant usage. Caterpillar knows Smith L-O for what it's worth — and to Caterpillar its quality and service is worth a lot. Perhaps you, too, would like to benefit by the use of this high-quality foundry product. Better write today for full particulars.

SMITH OIL & REFINING CO.

MANUFACTURERS OF L-O AND CERTIFIED CORE OILS
INDUSTRIAL OILS DIVISION — ROCKFORD, ILLINOIS

SMITH L-O CORE OIL

(*Concluded from page* 186)
fects on economical operation. The talk evoked a lively discussion period. The chapter will hold a class in gray iron metallurgy this year at a local high school.—*Roy A. Loder, Erie Malleable Iron Co.*

Chesapeake

SEVENTY-SIX members of Chesapeake Chapter of the AFS were guests of Bethlehem Steel Co., on Sept. 24 for an all day visitation to the Sparrows Point Plant of that company. The blast furnaces, open hearth, soaking pits, blooming mill and sheet and tin mills were among the operations visited.—*Henry M. Witmyer Jr., Foundry Service & Supply Co.*

Eastern New York

CASTING DEFECTS" was the subject of William A. Hambley, Chas. A. Krause Milling Co., at the October meeting of Eastern New York Chapter of the AFS held at Panetta's Restaurant, Menands, N. Y.

Speaker stated that a defect must be diagnosed as to type before correcting it. He divided defects into three classes: Major defects for which there is no hope of economical salvage, borderline defects where there is doubt whether it is cheaper to scrap or save the casting, and defective castings which require any work beyond normal procedure. Mr. Hambley said control of scrap is a management responsibility. Rejected castings currently are costing the industry $250 million annually.—*L. J. DiNuzzo, General Electric Co.*

Rochester

ROCHESTER Chapter of the AFS met Oct. 5 at Hotel Seneca, Rochester, to hear W. R. Jaeschke, consulting metallurgical engineer, Whiting Corp., Harvey, Ill., discuss "Cupola Operation." Mr. Jaeschke described the physical design and operational techniques of the cupola as it is used in American industry today. He offered practical suggestions on the size of coke, types of scrap, charging techniques, temperatures, air blast, cleanliness and maintenance.—*H. G. Stellwagen, Hetzler Foundries Inc.*

Tennessee

FIRST meeting for 1954-55 of Tennessee Chapter of the AFS was held Oct. 22 at Hotel Patten, Chattanooga. About 75 members and guests heard T. E. Barlow, International Minerals & Chemical Corp., speak on "High Pressure Molding." Charles Chisolm, Wheland Co., chapter chairman, presided, and William B. Grieser, Ross-Meehan Foundries, program chairman, introduced the speaker.—*W. F. Hetzler, Eureka Foundry Co.*

Central Michigan

THE Effect of Gating Practice" was the subject of John G. Kura, Battelle Memorial Institute, as he spoke Oct. 20 to Central Michigan Chapter of the AFS at its meeting at the Hart Hotel, Battle Creek, Mich. Technical chairman was Douglas Strong, president, Foundries Materials Co., Coldwater, Mich. Lachlan Currie, Gale Mfg. Co., chapter chairman, presided.—*L. Heisler, Gale Mfg. Co.*

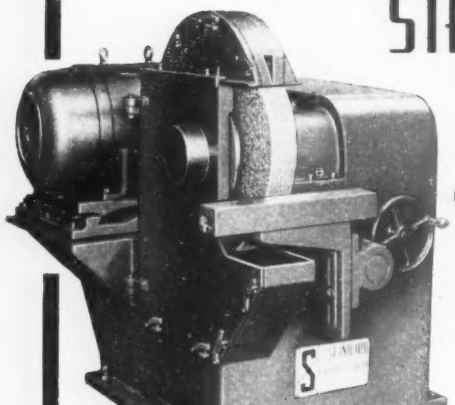
Cleveland Non-Ferrous

CLEVELAND Chapter of the Non-Ferrous Founders' Society held its annual clambake Oct. 29 at the Bessie Miller Broadview Club, Broadview Heights, O. Over 100 members and guests attended—*W. O. Larson Jr., Grafton Foundry Co.*

51% SAVINGS IN WHEEL COSTS!

(says a Midwestern foundry)

. . . SINCE WE INSTALLED STANDARD INFINITELY VARIABLE SPEED SNAGGING GRINDERS



Wheel Cost Per Ton of Castings Ground:

Before . . . $4.86

NOW . . . $2.38

SAVINGS . $2.48

ON EVERY TON OF CASTINGS GROUND!

+ INCREASED PRODUCTIVITY

+ BETTER "OPERATOR ATTITUDE"

Single and Twin Wheel Grinders
5 hp, 20" to 100 hp 30" Wheels

Grinders...ALL KINDS!
FOUNDRY GRINDER DIVISION

the STANDARD electrical tool co.
GRINDERS AND MACHINE TOOLS
2507 RIVER ROAD • CINCINNATI 4, • OHIO

Write for Catalog and Complete Details

Conferees See Savings In Proper Material Handling

Over 25 per cent of the national production payroll goes into the handling of materials in industry. Translated into dollars that amounts to $15 billion. In addition, $98 billion is spent to distribute finished products of this country's plants. These observations were made at a working conference covering new concepts on the economics of integrating material handling and transportation. Sponsored by the Material Handling Institute Inc., Pittsburgh; Chicago Association of Commerce and Industry and the Traffic Club of Chicago, the conference was held Oct. 20 at Drake Hotel, Chicago.

Another point brought out was that there is little co-ordination and application of material handling ideas and equipment in the nation's plants. Since the new frontier of greatest savings lies in proper use of material handling equipment and methods, it was suggested that more attention to this operation would be profitable. Principal aim of MHI is to aid industrialists in this endeavor.

National Safety Council Presents Awards

National Safety Council awards for exceptional public service in home accident prevention have been presented to plants of the Electro Metallurgical Co. and the United States Vanadium Co. The plants honored were Electro Metallurgical's plants in Alloy, W. Va.; Ashtabula, O.; Beauharnois, Que.; Marietta, O.; Niagara Falls, N. Y.; Sheffield, Ala. and Welland, Ont. and United States Vanadium's plants at Bishop, Calif., and Uravan, Colo.

Holds Successful Clinic

The first of a series of one-day nonferrous casting clinics sponsored by Federated Metals Division, American Smelting & Refining Co., was held Oct. 13 at Federated's research building, South Plainfield, N. J. About 100 persons attended, representing about half that number of foundries and manufacturing firms.

Robert A. Colton and Donald L. LaVelle, both of American Smelting & Refining Co., conducted informal morning and afternoon sessions on simple and practical fundamentals of melting, pouring, chills, gating, risering, risering compounds, and metal solidification. Those attending brought many castings for examination and analysis of their defects.

Get this triple-threat performance on your shell molds...

with SCHENECTADY

SP 7542 SHELL MOLD RESIN

1. Shells are straighter, more rigid — due to EXCELLENT HOT RIGIDITY
2. Shells are stronger, more uniform — due to SUPERIOR TENSILE AND TRANSVERSE STRENGTH
3. Shells are held to closer tolerances, eliminating oversized and warped castings—due to HIGH "POURING" STRENGTH

Schenectady Means Performance

There is a reason why the largest users of shell mold resins prefer Schenectady. Performance is that reason. Let us prove to you how Schenectady Resins can improve your shell molding operation. Let us show you how "performance" can help you open the door to greater shell molding economy. Mail the coupon today.

SCHENECTADY RESINS

Div. of Schenectady Varnish Company, Inc., 200 Congress Street, Schenectady 1, N. Y.
WEST COAST: R. E. Flatow & Co., 1525 Powell St., Oakland 8, Calif.

☐ Please have your representative call to arrange a demonstration of Schenectady Shell Mold Resin.

☐ Enclosed is order for a trial drum. (If not completely satisfactory, billing will be cancelled.)

Name_____

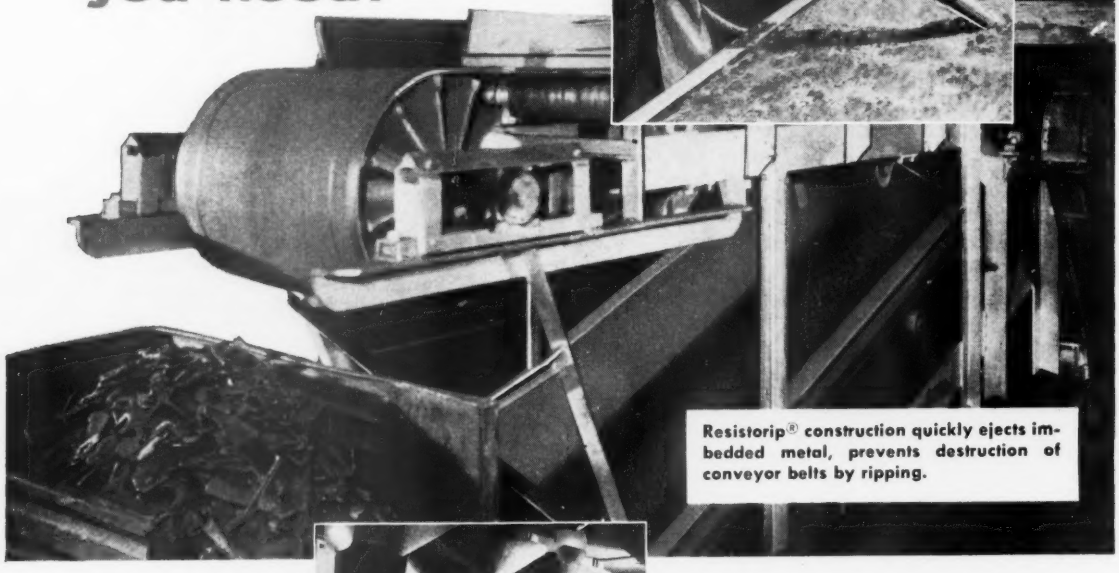
Company_____

Street_____

City_____ Zone____ State_____

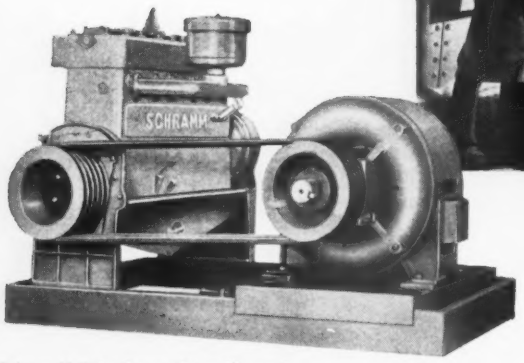
NYB&P Sand Suction Hose quickly moves hot or cold sand, resists abrasive wear.

Don't compromise— get the special foundry belting & hose you need!



Resistorip® construction quickly ejects imbedded metal, prevents destruction of conveyor belts by ripping.

For sand-blasting rough castings, you can't beat Double Diamond Sand Blast Hose.



Gilmer V-Belts have the pull—and the endurance—to keep air compressors on the job!

IN ADDITION to its multi-lived shakeout belts, with exclusive rip-checking "RESISTORIP" construction, New York Belting & Packing Co. serves the modern foundry with many other top-quality rubber products, including:

CONVEYOR BELTING—for any material, hot or cold.

TRANSMISSION BELTING—flat, V-belts and "Timing"® belts.

HOSE—air, paint and lacquer spray, sand blast, sand suction, water, steam, etc.

There's no need to compromise on inefficient, general-purpose hose or belting! Every NYB&P product is engineered for its specified service, using the most suitable fabrics, rubber compounds and manufacturing processes to produce the ultimate in satisfaction and durability. Rely on your nearby NYB&P Distributor for the best . . . and most economical in the long run! If he is not listed in your local classified directory, write to address below.

Gilmer "TIMING" BELT DRIVES AND V-BELTS

NYB&P INDUSTRIAL RUBBER PRODUCTS

NYB&P

NEW YORK BELTING & PACKING CO. Founded 1846

NEW YORK BELTING & PACKING CO. 1 Market St., Passaic, N. J.

America's Oldest Manufacturer of Industrial Rubber Products

AROUND THE COUNTRY

NEWS REPORTS FROM

Los Angeles
New York
Philadelphia
Chicago

New York . . .

WHILE sentiment among foundrymen is somewhat brighter, it is not being supported by any material improvement in operations. Actually, improved sentiment is based more on the outlook after the turn of the year, rather than what has transpired recently and what is likely to develop between now and that time.

Year-end influences will probably reduce December volume, as compared with November—and November was rather disappointing to most operators. However, with due allowance for the holiday lull, metalworking in general is building up a momentum which should be reflected more noticeably in castings as the new year gets under way, it is believed.

Currently, gray iron foundries are operating at no more than three to four days a week, with few exceptions. Backlogs continue light and there is little outstanding demand, except for certain construction specialties.

In brass and bronze, captive shops engaged in the manufacture of meters, valves and various bathroom fixtures are operating at a fair rate, but there is no overflow, and in general the job shops are operating rather poorly. There is little or no accumulation of orders, and this also is true with light metal shops, except those handling government work, notably castings for aircraft.

Los Angeles . . .

FOUNDRYMEN are freely predicting an active fourth quarter that may see some shops push 1954 sales volumes beyond their 1953 figures. One steel foundry, a leader in this district, reports that its 1954 business will be 10 per cent better than in 1953 if current sales and inquiries maintain their present pace. Although other operators are less enthusiastic, all but a handful expect the active fourth quarter to pull them to no worse than an even keel with 1953. Six months ago these same foundrymen were gloomily anticipating a second half not much better than the slow first half.

Trade observers looking for a concrete reason for the second half upsurge find six different answers from every half-dozen operators. Consensus is that a combination of reduced inventories, resumption of full production after summer vacation shutdowns and some unexpected special jobs have combined to push foundry sales upwards.

For the fourth straight month, steel shops operated in excess of 90 per cent of capacity, averaging 92 per cent. Most nonferrous shops reported slightly lower operating rates, but most are above 85 per cent. Overtime work is reported only in cases of special jobs, but few shops work less than 40 hours.

Casting buyers are not ordering as far in advance as they were earlier in the year, and long backlogs are not as common as they were in summer and spring. Currently most buyers are specifying close to immediate requirements—no more than 30 or 45 days in many cases—and with such a small cushion customers are requiring quicker service. For the most part, they're getting it, too, despite the heavy activity.

Chicago . . .

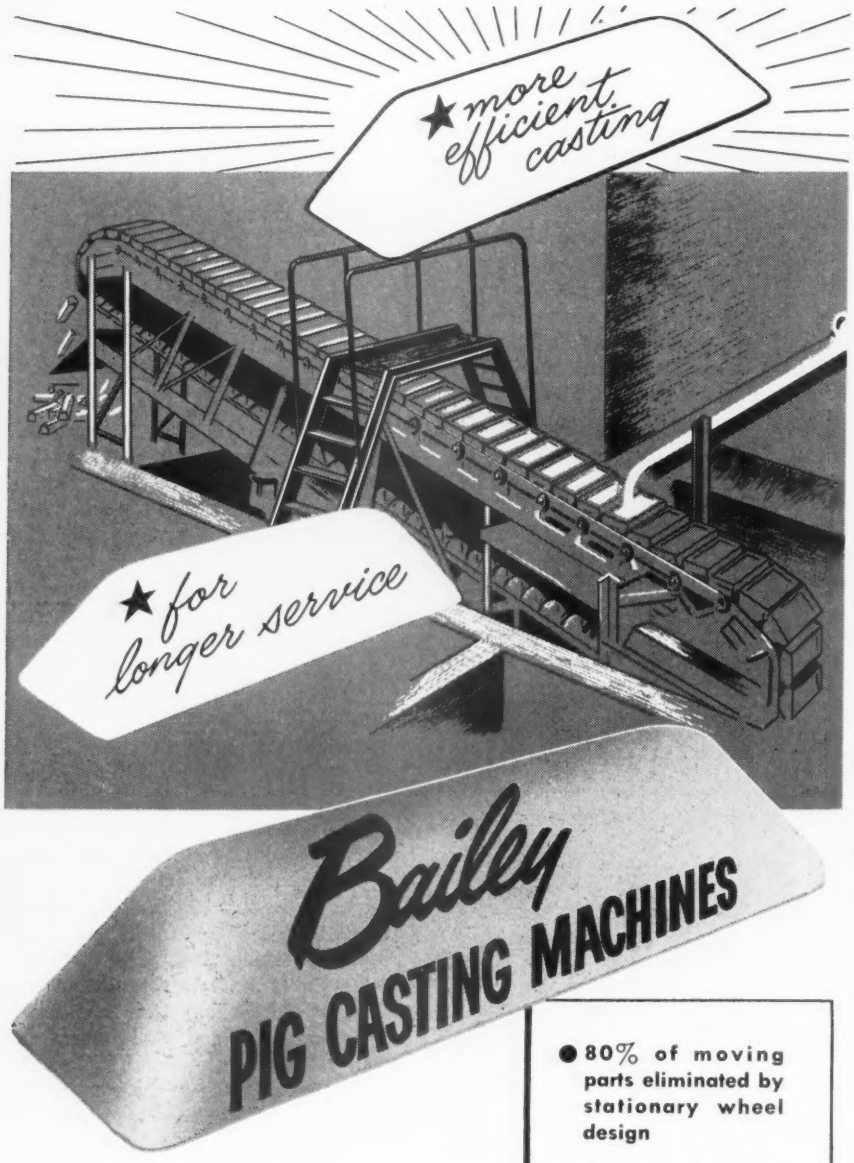
ON Feb. 2, 1954, the Chicago Chapter, AFS, announced establishment at the Chicago Undergraduate Division of the University of Illinois, Navy Pier, of the Robert E. Kennedy Scholarship Fund. It is intended to provide an annual scholarship for a student "selected for this honor on the basis of character, ability, interest in work related to the foundry industry, and financial need." At its regular meeting on Nov. 1, this year, the chapter announced the first recipient.

The award went to Philip S. Webber of LaGrange, Ill., now a junior in mechanical engineering at the University of Illinois in Champaign, Ill. Selection of Mr. Webber for the honor was on the basis of his outstanding record at the Navy Pier Branch of the university during the past two years.

Introduction of Mr. Webber to the AFS audience was made by Associate Dean of Engineering Fred W. Trezise. The checks representing the income from the endowment fund were presented by John A. Rassenfoss, assistant director of research, American Steel Foundries, who was chapter president last year when the scholarship fund was established. Mr. Kennedy, for whom the scholarship endowment is named, was present and given suitable recognition.

The endowment fund was set up by the Chicago Chapter as a tribute and expression of affection to Bob, its long-time member, who has devoted his life to educational aspects of the foundry industry. In June, last year,

First award from the Robert E. Kennedy Scholarship Fund was made recently by the Chicago Chapter, AFS, to Philip S. Webber, a junior at the University of Illinois. Shown at the presentation, left to right, are Bob Kennedy; Mr. Webber; R. L. Doelman, chapter chairman and Dean Fred W. Trezise of Illinois



- 80% of moving parts eliminated by stationary wheel design
- Capacities from 3 to 50 tons per hour
- Lengths: 15 to 125 feet, in multiples of 5 feet

Foundries and small capacity metal producing operations particularly benefit from the simplified design of these machines. The unique stationary wheels are the basic reason why the machines assure much more efficient casting and far longer service. In this design the idler wheels are mounted on the frame, rather than on the moulds, thus keeping them as far as possible from the hot metal. Completely self-contained, the unit includes the machine proper, a motor gear unit, and a variable speed reducer and drive.

WILLIAM M. Bailey COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY
1221 BANKSVILLE ROAD PITTSBURGH 16, PA.

Mr. Kennedy retired as associate professor in charge of the foundry and pattern laboratory which he helped to set up when the Navy Pier Branch of the university was established in 1946. In 1945 he had been made secretary emeritus of the AFS, which he had served in various capacities for 24 years.

The Chicago Chapter established the endowment fund with an initial $5000 withdrawn from its accumulated surplus. The agreement provides that subsequent additions may be made to the fund, and to that end the chapter is encouraging contributions to provide broader scholarship benefits. Only income from the fund is used.

Philadelphia . . .

BECAUSE of year-end influences —holidays and inventory taking— casting business here is expected to slump in December. This should make for a lean month, for trading at best has not been good in most lines. It is doubtful, when final returns are in, if November will show an improvement over October on an over-all basis. Some say that daily volume may average a shade better, but they believe that, in the light of fewer working days, total volume will be no greater, if as great.

Barring the pipe shops, which have been experiencing brisk business all along, gray iron foundries continue to average around four to five days a week. Backlogs have not extended beyond the average two-week range. Specifications for papermaking machinery are fairly active, but textile machinery requirements remain light and the needs of material handling equipment manufacturers are not too good.

While steel casting business has not improved, it at least has remained steady. Most shops are operating at four to five days a week, with order backlogs around five to six weeks. Casting needs for the $160,601,000 combat tank contract awarded the Newark, Del., plant of the Chrysler Corp. show some signs of stirring shortly after the turn of the year. These requirements will be largely steel, although some gray iron castings will be needed.

Business among the brass and bronze job shops remains spotty. Most of these foundries are operating five days, but on reduced daily schedules (seven hours or so). Aluminum and manganese production shops, engaged in aircraft and radar work, are doing very well, though backlogs are not overly extended, as

they were a year or so ago.

Pipe fittings are outstanding in an otherwise spotty market for malleable castings. Railroad requirements are slow and there is little in the way of automotive requirements in the East. The Mack plant at Allentown, Pa., recently received a sizable order for army trucks; however, the motors and most of the transmission parts, it is said, will be manufactured by International Harvester at Chicago, leaving only the fabrication of the chassis and the general assembly of the units for Allentown—at least for the most part.

SAE Publishes Manual On Blast Cleaning

Complete and up-to-date data on blast cleaning are given in a new manual recently approved by the Society of Automotive Engineers Technical Board. The handbook contains practical information for engineers, management and shop personnel needing specific advice concerning the blast-cleaning process.

Topics covered in the manual include blasting machines, blasting abrasives, recomended cleaning practices, production procedures, inspection, shot and grit specifications, life testing, shot acceptance testing and measuring shot-blasting efficiency. *SAE Manual on Blast Cleaning* is available from the Society of Automotive Engineers Inc., Special Publications Department, 29 West 39th St., New York 18, N. Y. for $2 to members and $4 to nonmembers.

Book Review

Plastic Engineering Handbook of the Society of the Plastics Industry Inc., cloth, 852 pages, published by Reinhold Publishing Corp., 430 Park Ave., New York 22. Price $15.

Second edition of the handbook has been rewritten completely to present a compilation of the latest engineering knowledge available on the design, materials and processing of plastic products. Twenty chapters are divided into five major sections: Materials and processes, design, finishing and assembly, testing, and standards. By chapters the following subjects are treated: Molding, preforming, drying, preheating, extrusion machines, forming, drawing and postforming, reinforcing plastics, embedding, vinyl dispersions, laminated products, standards for tolerances on molded articles, inserts, mold design, machining, finishing, decorating, cementing, welding, assembly, gluing, and testing.

Weld steel castings with little or no pre-heat!

Match analysis! Save on cost of electrodes!

Do all three with these 7
P&H LOW HYDROGEN ELECTRODES

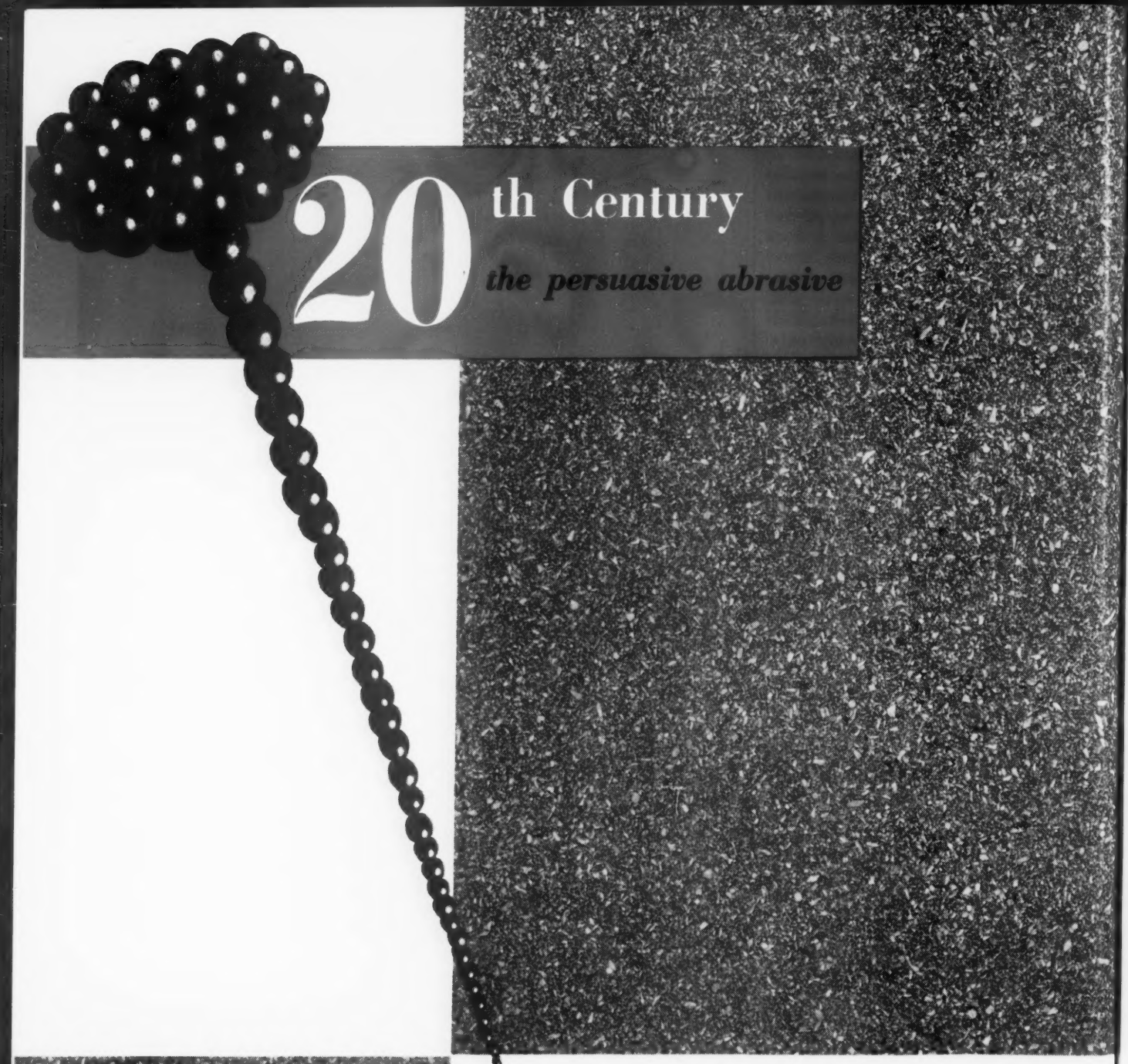
1. **70LB (E7016)** — Matches properties of Grade B and castings of similar analysis after heat treatment.
2. **P&H .25C (E7016)** — For castings repair where carbon is preferred to alloys for raising tensile strength. Lets you match both chemical analysis and heat-treating properties, a condition possible only with low-hydrogen coating.
3. **75LP (E8016)** — For 2% to 3% nickel steel castings. Charpy impact values of 20-35 ft. lbs. at −175° F.
4. **P&H .40C (E9015)** — For .40 carbon castings where you want to match both chemical and mechanical properties.
5. **AW2B (E9016)** — For repair welding of cast armor, "off analysis" and high-sulfur steels.
6. **P&H # 7 (E9016)** — Matches properties of Grade C and castings of similar analysis after heat treatment.
7. **90LH-2 (E10016)** — For high-tensile castings and alloy steels, such as SAE 8630, 4130, and comparable types, where the weld metal must match the heat-treating properties of the parent metal.

Get all the story on P&H Low-Hydrogen Electrodes. Write for Bulletin R-26.

P&H WELDING DIVISION
HARNISCHFEGER CORPORATION
4405 WEST NATIONAL AVENUE • MILWAUKEE 46, WIS.

the P&H *Line*

TRUCK CRANES · DIESEL ENGINES · POWER SHOVELS · PRE-FABRICATED HOMES · ELECTRIC HOISTS · SOIL STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES



20th Century

the persuasive abrasive

PINPOINT your thinking about metallic abrasives:

1. Look for a *tough*, long-wearing abrasive.
2. Keep a close eye on its *uniformity*.
3. Insist on *quality*.

You'll find our 20th Century *Normalized, the persuasive abrasive, will meet all these requirements *and* give you greater production efficiency and economy.

Write for our new catalog No. 1153.

THE CLEVELAND Metal Abrasive **CO.**

800 East 67th Street • Cleveland 8, Ohio
Howell Works: Howell, Michigan

*One of the world's largest producers of quality shot, grit and powder — Hard Iron — Malleable (*Normalized) — Cut Wire — Cast Steel (Realsteel)*

*Copyrighted trade name

FOUNDRY STATISTICS

MALLEABLE IRON

(Shipments of castings—net tons[1])

	Shipments		Unfilled Orders[2]
	Total	For Sale	
1952	926,120	573,472	.....
1953			
Aug.	73,855	45,415	120,801
8 mo.	683,698	409,675	.....
Sept.	74,333	45,466	114,523
Oct.	73,473	45,515	104,046
Nov.	63,435	37,500	93,156
Dec.	72,126	39,657	95,612
Total	967,065	577,813	.....
1954			
Jan.	70,288	38,266	85,565
Feb.	69,078	37,792	81,579
Mar.	84,342	47,125	74,219
Apr.	74,515	39,102	69,094
May	67,856	37,306	67,040
June	72,820	41,121	60,163
July	50,893	25,243	63,711
Aug.	59,239	34,528	62,494
8 mo.	539,051	300,483	.....

ALUMINUM

(Shipments of castings—1000 pounds)

	Shipments				Unfilled Orders[3]
	Total	Sand	Perm. Mold	Die	
1952	518,979	194,616	146,883	169,732	.....
1953					
Aug.	50,428	15,940	16,252	17,837	126,781
8 mo.	447,034	148,122	133,503	162,933	.....
Sept.	53,306	17,826	17,189	17,875	120,828
Oct.	55,097	17,171	17,030	20,547	115,189
Nov.	51,014	16,169	15,396	19,012	106,977
Dec.	51,571	15,265	16,907	18,963	105,980
Total	658,022	214,553	200,025	239,330	.....
1954					
Jan.	51,446	14,698	16,615	19,709	103,318
Feb.	51,213	14,696	17,281	18,754	96,011
Mar.	56,184	14,468	19,576	21,645	93,407
Apr.	53,006	14,073	18,091	20,366	91,853
May	47,663	12,461	16,312	18,368	83,848
June	48,061	12,442	17,105	17,886	79,126
July	39,636	11,299	13,749	14,004	76,513
Aug.	42,429	11,252	15,335	15,213	76,684
8 mo.	389,638	105,389	134,064	145,945	.....

PRODUCTION WORKERS

Estimated Number

(Thousands)

	July 1954	June 1954	July 1953
Ferrous	186,700	191,000	220,300
Nonferrous	56,200	58,200	76,900

Average Weekly Earnings

Gray Iron	$72.73	$73.30	$75.89
Malleable Iron	69.36	71.25	78.09
Steel	74.84	74.45	79.19
Nonferrous	78.17	79.19	80.59

Average Weekly Hours

Gray Iron	39.1	39.2	40.8
Malleable Iron	36.7	37.7	41.1
Steel	37.8	37.6	40.2
Nonferrous	38.7	39.4	40.7

Labor Turnover Rate (July)

(Per 100 employees)

	Total Accession	Total Separation	Quit	Layoff
Gray Iron	2.6	3.0	1.0	1.5
Malleable Iron	2.2	2.7	1.1	1.4
Steel	1.7	2.6	0.5	1.7
Nonferrous	3.8	5.0	0.7	3.6

Source: Bureau of Labor Statistics

COPPER-BASE ALLOY

(Shipments of castings—1000 pounds[1])

	Shipments			Unfilled Orders[2]
	Total	Sand	Perm. Mold	
1952	1,009,910	910,862	63,865	.....
1953				
Aug.	77,652	69,852	4,890	61,646
8 mo.	674,545	607,534	40,109	.....
Sept.	79,595	71,184	5,273	57,209
Oct.	83,899	74,460	5,775	51,723
Nov.	74,782	66,370	5,077	48,842
Dec.	77,675	68,821	5,082	48,421
Total	990,496	888,369	61,316	.....
1954				
Jan.	71,437	63,034	4,618	42,351
Feb.	68,849	60,913	4,743	21,943
Mar.	76,480	67,952	5,123	38,417
Apr.	72,900	65,418	4,732	34,111
May	67,859	61,469	3,755	31,568
June	70,777	64,328	3,567	30,743
July	56,380	51,070	3,073	30,872
Aug.	68,891	63,389	3,547	28,883
8 mo.	553,573	497,573	33,203	.....

MAGNESIUM

(Shipments of castings—1000 pounds[1])

	Shipments		Unfilled Orders[2]
	Total	For Sale	
1952	34,857	32,977	.....
1953			
Aug.	2,490	2,281	13,202
8 mo.	23,666	21,663	.....
Sept.	2,455	2,238	12,528
Oct.	3,024	2,717	11,473
Nov.	2,651	2,417	10,612
Dec.	2,691	2,434	9,313
Total	34,517	31,469	.....
1954			
Jan.	2,451	2,149	8,800
Feb.	2,194	1,945	8,315
Mar.	2,407	2,109	7,698
Apr.	2,068	1,857	7,358
May	1,738	1,541	7,522
June	2,034	1,820	8,296
July	1,924	1,712	8,073
Aug.	2,157	1,944	7,795
8 mo.	16,973	15,077	.....

GRAY IRON CASTINGS—SHIPMENTS

(Net tons[1])

	All Castings		Miscellaneous Castings		Heavy Steel Ingot Molds		Chilled Railroad Car Wheels	Pressure Pipe & Fittings	Soil Pipe & Fittings	Unfilled Orders[3]
	Total	For Sale	Total	For Sale	Total	For Sale	Total	Total[3]	Total[3]	
1952	12,862,494	7,373,757	8,095,299	3,794,164	2,238,309	1,070,252	544,896	1,312,518	651,472	.....
1953										
Aug.	1,069,392	588,543	646,902	286,449	217,930	107,428	40,327	107,805	56,428	1,222,612
8 mo.	9,346,837	5,039,123	5,829,661	2,497,745	1,878,776	912,872	343,053	854,870	450,477	.....
Sept.	1,105,582	611,905	669,225	289,909	232,055	117,694	37,055	108,270	58,977	1,170,191
Oct.	1,141,526	650,229	669,757	300,249	245,966	124,177	41,917	118,306	65,580	1,075,538
Nov.	1,004,326	563,930	589,657	266,039	227,800	111,022	31,373	101,576	53,920	977,012
Dec.	1,032,444	552,565	634,250	274,203	228,532	108,700	30,051	94,053	45,558	954,885
Total	13,630,715	7,417,752	8,392,550	3,537,645	2,813,129	1,374,465	473,449	1,277,075	674,512	.....
1954										
Jan.	932,298	488,497	607,755	261,164	154,359	60,947	31,316	90,898	47,970	871,918
Feb.	936,364	491,983	607,085	252,591	156,933	70,261	29,240	92,546	50,560	865,344
Mar.	1,046,779	553,358	684,272	282,328	153,366	65,950	34,240	113,016	61,895	842,499
Apr.	995,052	528,027	657,126	263,147	126,083	56,114	29,075	116,420	66,348	826,491
May	943,335	516,475	605,385	247,623	122,839	57,106	27,144	122,514	65,453	775,278
June	986,810	556,047	616,317	261,133	141,712	70,060	30,883	130,503	67,395	803,570
July	821,151	449,621	510,173	209,294	131,180	62,681	22,902	98,810	59,086	828,924
Aug.	934,644	541,904	569,790	250,702	140,165	69,897	29,134	127,255	68,300	829,505
8 mo.	7,596,433	4,126,112	4,857,903	2,027,982	1,126,637	513,016	233,934	891,962	487,007	.....

STEEL CASTINGS—SHIPMENTS

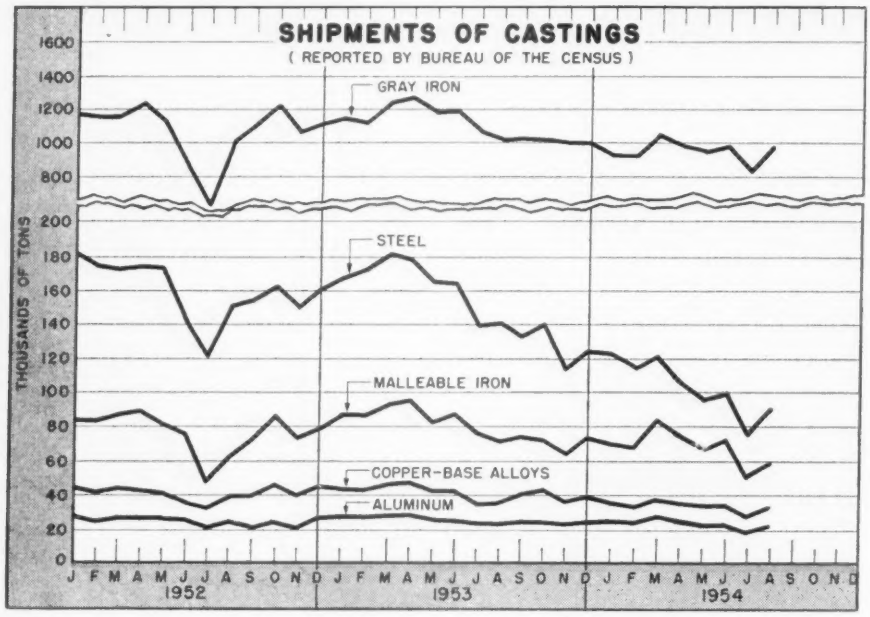
(Net tons[1])

	All Castings			Carbon Steel			Alloy Steel			Unfilled Orders[3]
	Total	For Sale	Railway Specialties	Total	For Sale	Railway Specialties	Total	For Sale	Railway Specialties	
1952	1,925,707	1,476,746	342,561	1,496,450	1,053,264	298,948	553,403	430,493	40,613	.....
1953										
Aug.	141,340	107,941	25,026	97,076	73,784	22,637	44,264	35,003	2,389	418,927
8 mo.	1,315,913	1,012,327	236,589	925,202	706,025	215,830	390,721	310,541	20,759	.....
Sept.	135,303	102,880	24,108	95,944	72,780	21,724	39,359	30,338	2,384	327,172
Oct.	140,702	106,788	25,354	100,568	76,118	23,449	40,134	30,988	1,905	313,684
Nov.	114,088	84,945	17,784	79,989	57,947	16,233	34,099	27,167	1,551	308,526
Dec.	123,281	91,017	18,685	86,465	62,377	16,998	36,674	29,952	1,687	278,389
Total	1,829,287	1,397,957	322,520	1,288,168	975,247	294,234	540,977	428,986	28,286	.....
1954										
Jan.	122,758	93,577	20,197	83,927	62,749	18,407	38,831	30,828	1,790	251,847
Feb.	116,520	88,699	17,938	81,433	60,638	15,961	35,087	28,061	1,967	234,634
Mar.	122,310	92,271	15,684	85,211	62,955	14,190	37,099	29,316	1,494	214,367
Apr.	105,788	78,754	11,031	72,118	52,389	9,538	33,670	26,365	1,493	197,857
May	94,610	70,596	9,454	64,546	46,651	8,342	30,064	23,945	1,112	182,502
June	100,022	72,881	8,639	69,021	48,327	7,552	31,001	24,554	1,087	169,594
July	75,848	53,207	5,815	50,453	33,461	4,964	25,125	19,746	851	170,567
Aug.	89,590	66,792	9,344	61,344	44,236	8,148	28,256	21,360	1,196	168,303
8 mo.	827,446	616,777	98,102	568,053	411,406	87,102	259,133	204,175	10,990	.....

[1]Source: Bureau of Census. [2]For sale only. [3]All cast iron pipe is shipped for sale.

(Concluded on page 196)

FOUNDRY STATISTICS (Concluded from page 195)



COKE PRODUCTION & CONSUMPTION

(Net tons)

	Production	Consumption Total	Consumption By Foundries
1952 ...	68,254,109	67,865,639	3,102,446
1953			
Aug. ...	6,719,941	6,587,005	236,738
8 mo..	53,207,861	53,260,164	2,015,757
Sept. ...	6,404,143	6,330,441	236,119
Oct. ...	6,554,638	6,555,613	236,329
Nov. ...	6,208,155	6,039,813	216,837
Dec. ...	6,093,009	6,041,383	210,388
Total .	78,467,806	78,227,414	2,915,420
1954			
Jan. ...	5,812,426	5,639,117	224,298
Feb. ...	4,889,717	4,920,651	211,114
Mar. ...	5,146,189	5,177,765	228,139
Apr. ...	4,693,036	4,569,843	212,272
May ...	4,802,245	4,656,950	204,958
June ...	4,640,064	4,683,726	194,664
July ...	4,618,665	4,555,701	170,617
Aug. ...	4,512,444	4,497,375	193,548
8 mo..	39,114,786	38,701,128	1,639,610

INGOT BRASS & BRONZE

(Shipments in net tons)

	1953	1954
Jan.	24,423	20,661
Feb.	25,429	19,920
Mar.	28,256	23,653
Apr.	25,044	24,746
May	21,660	22,269
June	20,818	22,348
July	19,321	17,074
Aug.	20,156	21,684
Sept.	21,463	22,464
Oct.	22,280	.....
Nov.	21,860	.....
Dec.	20,541	.....
Total for year	271,251	.....

FERROUS CASTING SHIPMENTS

(By Size of Foundry)

Annual Shipments	Gray Iron Number Foundries	Gray Iron Shipments (short tons)	Malleable Number Foundries	Malleable Shipments (short tons)	Steel Number Foundries	Steel Shipments (short tons)
1953 Total	2,250	13,707,902	125	970,506	349	1,834,197
Less than 1000 tons.	1,080	409,818	21	8,307	118	40,842
1000-2499	498	793,086	25	38,348	72	120,398
2500-4999	253	889,694	37	128,327	62	235,540
5000-19,999	305	2,929,380	35	344,584	73	678,548
Over 20,000 tons	114	8,685,924	7	450,940	24	758,869

ZINC-BASE ALLOY

(Shipments of castings—1000 pounds[1])

	Shipments Total	Shipments For Sale	Unfilled Orders[2]
1952	408,353	282,673	.....
1953			
Aug.	37,800	23,817	78,303
8 mo. ..	365,431	241,087	.....
Sept.	38,611	26,049	72,944
Oct.	40,882	28,441	73,237
Nov.	37,668	26,097	69,367
Dec.	38,661	27,348	64,105
Total ..	521,253	349,022	.....
1954			
Feb.	37,660	24,112	55,351
Mar.	42,991	28,828	52,544
Apr.	38,968	25,211	51,388
May	36,793	23,671	46,726
June	40,708	26,890	47,537
July	28,306	18,605	43,231
Aug.	34,639	24,898	46,288
8 mo. ..	300,461	209,472	.....

INDEX OF FOUNDRY EQUIPMENT ORDERS

Foundry Trades Only

(Net Orders Closed, New Equipment)

	1953	1954
Jan.	99.6	173.8
Feb.	97.5	99.9
Mar.	132.2	82.7
Apr.	111.8	125.3
May	182.7	80.8
June	156.8	86.4
July	159.2	68.8
Aug.	236.3	75.6
Sept.	127.7	68.3
Oct.	87.2	....
Nov.	150.0	....
Dec.	161.2	....

Note: Figures are percentages of the base period 1947-49 taken as 100 per cent (monthly average). This is a new base period. Source: Foundry Equipment Manufacturers Association.

IRON AND STEEL SCRAP CONSUMPTION

(Gross tons*)

	All Scrap Total	By Types of Furnace: Cupola Total	Air Total	Electric Total
1952	61,625,549	9,154,146	1,053,233	8,015,064
1953				
July	5,539,468	729,114	74,815	691,521
7 mo.	42,609,086	5,918,842	664,601	5,452,027
Aug.	5,637,759	753,272	77,047	678,968
Sept.	5,395,721	782,131	80,866	595,523
Oct.	5,628,568	779,444	75,618	566,878
Nov.	5,064,565	687,498	60,200	477,666
Dec.	4,690,277	755,276	68,002	442,818
Total	69,005,976	9,676,463	1,026,334	8,263,880
1954				
Jan.	4,574,384	711,335	71,202	505,536
Feb.	4,385,340	704,535	67,263	462,095
Mar.	4,637,573	783,529	82,337	517,702
Apr.	4,582,862	748,766	79,183	518,048
May	4,776,603	710,159	67,368	506,582
June	4,664,561	725,910	75,306	515,019
July	3,909,336	565,275	45,920	420,564
7 mo.	31,530,659	4,949,509	488,579	3,445,546

PIG IRON PRODUCTION AND CONSUMPTION

	Production** (Standard grades—net tons) Total	Foundry	Malleable	Basic	Low Phos. Intermediate Low Phos. & Bessemer	Consumption* (By type of furnace—gross tons) Total	Cupola	Air	Electric
1952	61,306,723	2,864,722	3,013,267	48,253,390	7,175,344	61,550,961	5,438,294	449,646	118,820
1953									
Sept. ...	6,121,399	209,444	310,441	4,926,986	674,528	5,378,517	393,292	21,775	16,039
9 mo..	56,761,818	2,007,097	2,891,936	45,805,176	6,326,617	50,487,575	3,805,343	214,838	122,658
Oct. ...	6,409,245	218,880	290,882	5,175,064	724,479	5,733,466	395,066	21,349	13,206
Nov. ...	5,995,511	201,047	277,181	4,859,252	658,031	5,324,537	343,233	17,528	15,842
Dec. ...	5,712,937	172,283	276,432	4,625,524	638,698	5,091,786	374,838	18,596	12,561
Total .	74,878,511	2,599,307	3,736,431	60,465,016	8,347,817	66,637,364	4,918,480	272,311	164,267
1954									
Jan. ...	5,531,137	184,629	294,691	4,510,870	540,947	4,933,282	362,576	17,620	14,578
Feb. ...	4,764,613	156,178	272,707	3,911,670	424,058	4,293,942	351,824	17,257	9,892
Mar. ...	4,907,147	213,249	243,356	3,977,137	473,405	4,367,814	390,929	21,369	13,112
Apr. ...	4,449,289	155,249	256,662	3,630,901	406,477	4,021,957	375,045	26,553	10,497
May ...	4,572,252	154,768	231,479	3,741,671	444,334	4,188,269	367,437	16,453	16,531
June ...	4,683,629	175,759	200,154	3,853,444	454,272	4,297,531	375,601	18,545	14,196
July ...	4,590,076	182,130	182,527	3,790,999	434,420	3,990,431	293,926	12,258	13,317
Aug. ...	4,529,291	186,097	165,891	3,722,094	455,209	.....	.....	.....	.....
Sept. ...	4,417,888	188,599	179,629	3,622,799	426,861	.....	.....	.....	.....
9 mo..	42,445,322	1,596,658	2,027,096	34,761,585	4,058,653				

*Source: U. S. Dept. of Interior. Bureau of Mines. **Source: American Iron & Steel Institute. [1]Source: Bureau of the Census. [2]For sale only.

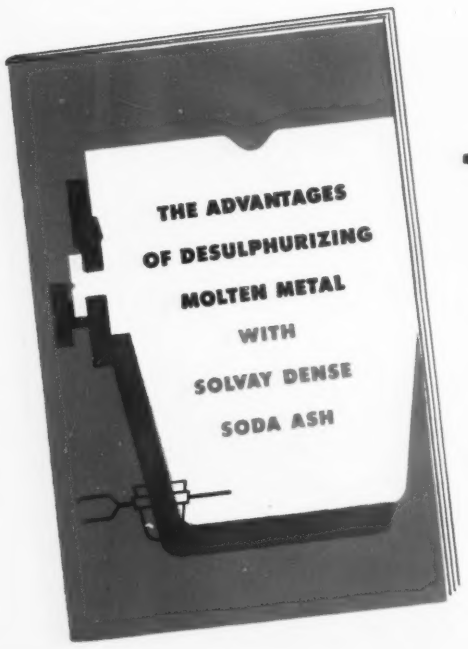
DEDICATED
TO SERVING YOU
with a
Growing Line of
Quality Ferro-Alloys
FERRO-SILICON 25-50-65-75-85-90%
SPECIAL BLOCKING 50% FERRO-SILICON
SILICON METAL
LOW CARBON FERROCHROME SILICON
HIGH CARBON FERROCHROME
LOW CARBON FERROCHROME
SILICO-MANGANESE
FERRO-MANGANESE
MEDIUM CARBON FERRO-MANGANESE
BOROSIL • SIMANAL • RARE EARTH ALLOYS
Briquets
SILICON • MANGANESE
SILICO-MANGANESE
CHROME
PHILO
TACOMA
BRILLIANT
DEPENDABILITY
QUALITY • SERVICE
Ohio Ferro-Alloys Corporation
Canton, Ohio
Chicago Detroit Pittsburgh Tacoma Seattle
Minneapolis Birmingham San Francisco Los Angeles

Desulphurization with SOLVAY DENSE SODA ASH

✓ Offers Many Advantages

✓ Costs Less

SOLVAY DENSE SODA ASH is especially effective for desulphurization. This 100% active material helps produce better, more fluid metal . . . and gives you these other advantages: it's free-flowing; the small grains melt very rapidly, allowing faster, more uniform dispersion; and it's easily added by means of simple equipment. The use of Solvay Dense Soda Ash is a flexible one—you use only as much as you need. And remember, Solvay Dense Soda Ash is the *low cost* form of desulphurization!



Further Information Contained in Valuable Book—Available on Request

"The Advantages of Desulphurizing Molten Metal with Solvay Dense Soda Ash" has been published by Solvay for the benefit of the foundryman. It contains important information on the advantages you can gain by desulphurizing with Solvay Dense Soda Ash. It also explains what type of equipment is needed and how to obtain it. This book is available free—on request—by simply writing to Dept. AT-12,. Be sure to get your copy.

SOLVAY PROCESS DIVISION
ALLIED CHEMICAL & DYE CORPORATION
61 Broadway, New York 6, N. Y.

BRANCH SALES OFFICES:
Boston • Charlotte • Chicago • Cincinnati • Cleveland • Detroit • Houston
New Orleans • New York • Philadelphia • Pittsburgh • St. Louis • Syracuse

Soda Ash · Caustic Soda · Potassium Carbonate · Calcium Chloride · Chlorine
Caustic Potash · Cleaning Compounds · Ammonium Bicarbonate · Sodium Nitrite
Sodium Bicarbonate · Snowflake® Crystals · Para-dichlorobenzene · Monochlorobenzene
Ortho-dichlorobenzene · Ammonium Chloride

SOLVAY

Standard Specification for

Tin-Bronze and Leaded Tin-Bronze Sand Castings

ASTM Designation: B 143—52

Adopted, 1948; Revised, 1949, 1952

Scope

1. This specification covers castings of four alloys having ASTM classifications, alloy numbers and commercial designations shown in Table I.

Note 1.—This specification covers the technical requirements for copper-base alloy castings and is not intended for use for the corresponding alloys in ingot form which are specified in the Standard Specifications for Copper-Base Alloys in Ingot Form for Sand Castings (ASTM Designation: B 30).

Note 2.—For castings for valves and fittings reference should be made to the Standard Specification for Steam or Valve Bronze Castings (ASTM Designation: B 61).

Basis of Purchase

2. Orders for material under this specification shall include the following information:

1. Alloy number (Section 1),
2. Tests or certification required (Sections 5, 8, 10, 16), and
3. Marking, if required (Section 14).

Manufacturer

3. (a) The alloy may be made by any approved method. If alloys in ingot form are used, the alloy ingot selected shall have the same ASTM classification and alloy number as prescribed in this specification and shall conform to the requirements for that alloy as prescribed in the Standard Specifications for Copper-Base Alloys in Ingot Form for Sand Castings (ASTM Designation: B 30).

(b) The castings shall be made in accordance with such practice as to obtain the physical properties prescribed in this specification.

(c) The casting shall be of uniform quality.

Chemical Composition

4. The castings shall conform to the requirements as to chemical composition prescribed in Table II.

Chemical Analysis

5. (a) An analysis of each melt may be required at the option of the purchaser. If the castings are made from ingot metal in accordance with the Standard Specifications for Copper-Base Alloys in Ingot Form for Sand Castings (ASTM Designation: B 30), or returns (backstock) of known composition, and if the foundry practice of the manufacturer is satisfactory to the inspector, and if melting and casting are witnessed by the inspector, he may waive further chemical analysis.

(b) The sample for chemical analysis shall be taken by drilling or cutting the test coupon or sprue in such a manner as to be representative of the entire cross section.

Methods of Chemical Analysis

6. Analyses, when made, shall be performed in the case of tin bronzes in accordance with the Standard Methods for Chemical Analysis of Special Brasses and Bronzes (ASTM Designation: E 54).

Tensile Properties

7. The material shall conform to the requirements as to tensile properties prescribed in Table III.

Hydrostatic Test

8. The castings made from these alloys shall conform to such requirements as to pressure and fracture tests as may be agreed upon by the manufacturer and the purchaser and as specified in the order.

Test Specimens

9. It is recommended that the test coupons and specimens for tension tests be prepared in accordance with the Tentative Recommended Practice for Tension Test Specimens for Copper-Base Alloys for Sand Castings (ASTM Designation: B 208), except that Fig. 1 of B 208 is not applicable to these alloys.

Table I—Nominal Compositions

Classification and Alloy Number		Commercial Designation	Copper Per Cent	Tin Per Cent	Lead Per Cent	Zinc Per Cent
Tin Bronze	1A	88-10-2 or "G" bronze	88.00	10.00	....	2.00
	1B	88-8-4 or modified "G" bronze	88.00	8.00	....	4.0
Leaded Tin Bronze	2A	Steam or valve bronze (Navy "M" 83-6-2-4)	88.00	6.00	1.50	4.5
	2B	Commercial 88-8-4 (87-8-1-4)	87.00	8.00	1.00	4.00

Table II—Chemical Requirements

Classification	Tin Bronze				Leaded Tin Bronze			
Alloy Number	1A[a]		1B		2A		2B	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Copper, per cent	86.0*	89.0*	86.0*	89.0*	86.0*	90.0*	85.0*	89.0*
Tin, per cent	9.0*	11.0*	7.5*	9.0*	5.5*	6.5*	7.5*	9.0*
Lead, per cent	....	0.30*	....	0.30*	1.0*	2.0*	....	1.0*
Zinc, per cent	1.0	3.0	3.0	5.0	3.0	5.0	2.5	5.0
Nickel, per cent	....	1.0*	....	1.0*	....	1.0*	....	1.0*
Iron, per cent	....	0.15	....	0.15	....	0.25	....	0.25
Phosphorus, per cent	....	0.05	....	0.05	....	0.05	....	0.05

Note—Analysis shall be regularly made only for the elements designated*. However, the presence of other named elements outside of the limits specified in this table shall constitute cause for rejection of the castings.

[a] The chemical requirements of SAE Specifications Nos. 62, 620, 621 and 622 conform to the requirements for the alloys 1A, 1B, 2B and 2A, respectively.

Table III—Tensile Requirements

Classification	Tin Bronze		Leaded Tin Bronze	
Alloy Number	1A	1B	2A	2B
Tensile strength, min., psi	40 000	40.000	34.000	36.000
Yield strength,[a] min., psi	18.000	18.000	16.000	16.000
Elongation in 2 in. min., per cent	20	20	22	18

[a] Yield strength shall be determined as the stress producing an elongation under load of 0.5 per cent, that is, 0.01-in. in a gage length of 2 in.

FOUNDRY Data Sheet

Number of Tests

10. (a) Three test coupons shall be poured from each melt of metal, or such groups of melts as the purchaser may specify, but in no case shall a lot consist of more than 1000 lb of castings, except if individual castings weigh more than 1000 lb. The inspector shall witness the pouring of the test molds.

(b) If any test specimen shows defective machining or reveals casting defects, it may be discarded and replaced by another specimen selected by the inspector.

(c) The specimens shall be made and tested at the expense of the manufacturer. The inspector shall witness the testing.

(d) One test specimen shall be tested. If the physical requirements are met by this one test, the lot shall be accepted. If the first test specimen fails to conform to the requirements specified, the two remaining specimens shall be tested. If the average properties of the two remaining specimens conform to the requirements specified, the lot shall be accepted.

Methods of Testing

11. The tension tests shall be made in accordance with the Tentative Methods of Tension Testing of Metallic Materials (ASTM Designation: E 8).

Significance of Numerical Limits

12. For purposes of determining compliance with the specified limits for requirements of the properties listed in the following table, an observed value or a calculated value, shall be rounded off as indicated in accordance with the rounding-off method of the Recommended Practices for Designating Significant Places in Specified Limiting Values (ASTM Designation: E 29).

Property	Rounded-off unit for Observed or Calculated Value
Chemical Composition	Nearest unit in the last right-hand place of figures
Tensile Strength, Yield Strength	Nearest 1000 psi
Elongation	
5 per cent and over	Nearest 1 per cent

Workmanship and Finish

13. (a) The castings shall be free from blowholes, porosity, hard spots, shrinkage defects or cracks, or other injurious defects and shall be smooth and well cleaned before inspection, by sandblasting, tumbling, chipping or other process approved by the inspector.

(b) The castings shall not be repaired, plugged, welded, or "burned-in," unless permission from the inspector has been previously secured. This permission will be given only when the defects are such that after the approved repair the usefulness and strength of the casting has not been impaired. Each such repair shall be encircled by a ring of white paint at the time of shipment.

(c) All castings shall be true to pattern, free from swells, etc. Wall thicknesses shall be uniform throughout the lot of castings and all cores shall be accurately set.

(d) Where thick and thin sections join, the manufacturer shall be permitted to add (where not previously provided) fillets of proper size to avoid cracking upon cooling, subject to the approval of the inspector.

(e) The manufacturer shall not be responsible for the dimensional accuracy of the patterns furnished by the purchaser.

Marking

14. (a) Upon request of the purchaser, castings shall be marked with the pattern or marking number at a position on the casting where it will not be machined off in manufacture to finished dimensions.

(b) Upon request of the purchaser, valves, flanges and fittings shall be marked in accordance with the Standard Marking System for Valves, Fittings, Flanges, and Union (No. SP-25—1936) of the Manufacturers Standardization Society of the Valve and Fittings Industry, and in such position as not to injure the usefulness of the casting.

Inspection

15. (a) Inspection may be made at the manufacturer's works or at the place of delivery. Inspection shall be made at the option of the purchaser.

(b) If the purchaser elects to have the inspection made at the manufacturer's works, the inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works that concern the manufacture of the material ordered. The manufacturer shall afford the inspector, without charge, all reasonable facilities to satisfy him that the material is being furnished in accordance with this specification. All tests and inspection shall be so conducted as not to interfere unnecessarily with the operation of the works.

Certification

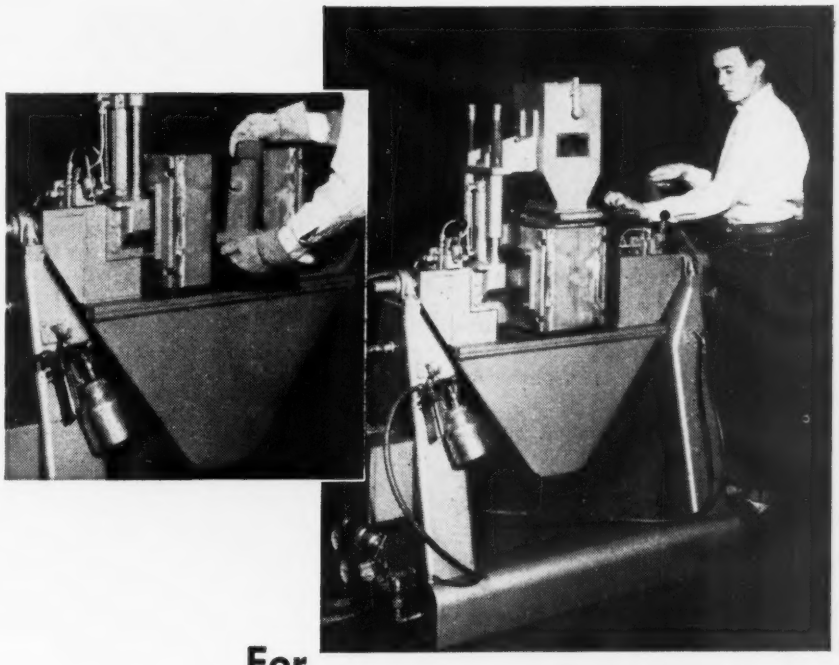
16. In the case of a product manufactured in advance and supplied for sale from stock by the manufacturer, jobber, or other dealer, the product may be, upon request of the purchaser, certified by the manufacturer as conforming to this specification subject to the following procedure: Not less than two tension tests, from different heats, and not less than one chemical analysis shall be made by the manufacturer from each day's melt. Records of the tension test results and chemical analysis shall be systematically made and maintained and shall be the basis for a certification. In lieu of the manufacturer's certification and upon written request by the purchaser, these records may be examined by the purchaser or his accredited representative upon the manufacturer's premises.

Rejection

17. Castings that show injurious defects revealed by machining operations subsequent to acceptance may be rejected, and if rejected, the foundry shall be notified within 30 days. The full weight of the original material rejected shall be returned to the foundry. The foundry shall not be responsible for the costs of machining defective castings.

Additional copies of this specification may be obtained from the American Society for Testing Materials, 1916 Race St., Philadelphia 3, for a nominal sum.

(Advertisement)



For low cost, accurate, shell molding, specify...

Rugged and compact, the MC-4 core machine designed by Shalco Engineering Corp., Palo Alto, California, produces a finished core by the shell process every 30 to 50 seconds. Built-in heaters complete the curing in the corebox, eliminating core driers, ovens and handling; cores are delivered fully cured and ready for setting. Requiring power of only 5 KW, 200V and an air pressure of 100 psi., the MC-4 has a capacity of up to 12"x9"x6".

DOW CORNING 8 EMULSION

Assures Fast, Positive Release • Keeps Patterns Clean Nonflammable and Noncorrosive • Dilutible in Hard or Soft Water • Resists Creaming or Separating

Especially designed for the shell process, Dow Corning 8 Emulsion, a silicone parting agent, can't break down to form a carbonaceous deposit on patterns. Cleaning costs are minimized and you increase production of shells with consistently high dimensional accuracy. For more information and a free trial sample, return the coupon today.

DOW CORNING MIDLAND — *first in silicones* — DOW CORNING SILICONES — CORPORATION MICHIGAN

ATLANTA CHICAGO CLEVELAND DALLAS DETROIT LOS ANGELES NEW YORK WASHINGTON, D.C. (SILVER SPRING, MD.)
CANADA: DOW CORNING SILICONES LTD., TORONTO ENGLAND: MIDLAND SILICONES LTD., LONDON FRANCE: ST. GOBAIN, PARIS

DOW CORNING SILICONES **in the Foundry**

FIGHTING CORROSION caused by soda ash? Try a silicone based paint. A southern foundry found soda ash was corroding the frames of fan motors operating in exhaust stacks. A year ago the frames were coated with a silicone based paint. No visible signs of corrosion have appeared since; the silicone paint is still in excellent condition.

ROLLER BEARING LUBRICATION was a major headache to one eastern foundry. The bearings, located on a sintering conveyor, required daily lubrication with a bentonite base grease to maintain operation at oven temperatures in the range of 350 F. After changing to Dow Corning 44 silicone grease, foundry maintenance men cut the relubrication schedule to once every eight weeks.

OVERLOADS AND HIGH TEMPERATURES are death to organic insulated motors. Take, for example, the 5 hp Class A drive motor on a hot ingot conveyor in another eastern foundry. Operating on a 20 second start and stop cycle, the motor hardly gets up to speed before it is shut down. This, plus extremely high ambient temperatures caused the motor to burn out about every six weeks.

Four years ago the motor was rewound with Class H insulation made with Dow Corning silicones. The Class H job cost about twice as much as a Class A rewind but the silicone insulated motor hasn't failed yet. That's more than 30 times the life. Imagine the savings in rewind costs!

For more information about any of these Dow Corning silicone products,

Send this coupon TODAY

DOW CORNING SILICONES

DOW CORNING CORP.
Dept. AH-24
Midland, Michigan

Gentlemen: Please send me
- ☐ Free sample of Dow Corning 8 Emulsion
- ☐ Silicone-based Protective Coatings
- ☐ Description of Silicone Greases
- ☐ Performance data on Class H Insulation

Name_____

Company_____

Address_____

FOUNDRY COSTS AND CASTING QUALITY

Are Featured Topics at the All-Canadian Conference

By ROBERT H. HERRMANN
Associate Editor

COST and quality improvement, pattern engineering, gating design and pressure molding claimed the attention of foundrymen at the Fifth All-Canadian Foundry Conference. Held at the King Edward Hotel, Toronto, Oct. 28-29, the conference drew more than 250 to its discussion sessions.

Short welcoming talks were given at the opening luncheon by Leslie Saunders, Toronto mayor; H. G. Robertson, American Steel Foundries, Alliance, O., and regional AFS vice president, and Harry E. Gravlin, Claude B. Schneible Co., Detroit. Mr. Robertson outlined AFS activities. Mr. Gravlin, in a few, rapid-fire words, spoke of the importance of the foundry industry. Be proud of it. Do not apologize for it. Sell it to people. Talk it up.

D. L. Watson, Homes Foundry Co., Sarnia, Ont., spoke at the first session. His paper was "Foundry Fact Finding for Cost and Quality Improvement." It told where statistical quality control methods can be applied in foundries, personnel required, where it fits into the company organization and the mechanics of gathering and using data. Such a program should cost about one per cent of the foundry's yearly gross sales.

Mr. Watson told of the importance of keeping daily records to develop workable facts to govern future operations. He also said that one man should be in charge of the control operation, devoting full time to it, if possible. Such a man should understand foundry operations, be able to get along with people and realize the possibilities and advantages of fact-finding techniques. He should be on a level with all department heads, reporting to top management. He should have power to question anyone and get proper answers, and, also, he should be unbiased.

The second session dealt with pattern engineering. E. T. Kindt, Kindt-Collins Co., Cleveland, was the speaker. He said that the number of patternmakers in the trade decreases by 5 per cent annually. Unless this trend is reversed, there soon will be a shortage of mechanics to produce the most important tool used in foundries.

Thursday night's dinner speaker was A. Levenstein, Research Institute of America, who spoke on "Human Relations—a New Dimension of Business." He suggested that management and employees might eliminate much friction in their relationships if their efforts could be directed in common activity toward a common goal. No one likes to work, according to Mr. Levenstein, but if work has a common purpose, a man can apply himself willingly.

Cost methods and quality control again claimed the attention of conferees in a panel discussion Friday morning. Panelist J. P. Lubenkov, Link-Belt Ltd., Elmira, Ont., spoke first on "Getting Cost Ideas to Foremen." In his foundry, which is 50 per cent captive—50 per cent jobbing, 120 tons of castings are produced monthly. Each department is operated like a separate corporation.

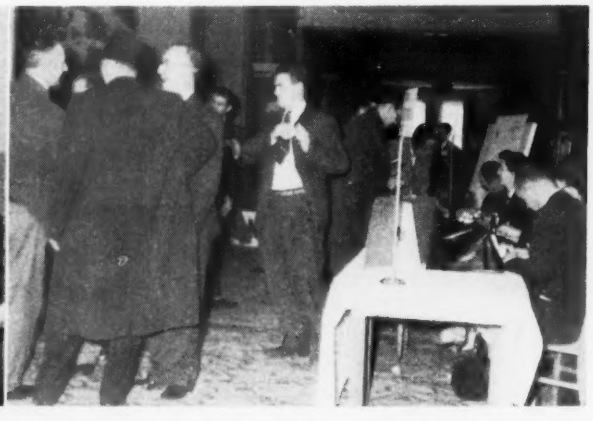
The head of the company's cost department meets monthly with each foreman to discuss cost control for the department as well as for individual jobs. Also a monthly group meeting of all foremen is held to discuss costs on an overall company basis. These meetings bring the flavor of competition into departmental endeavor to reduce costs. At the year's end the cost department head meets with each foreman to plan the next year's budget for his section.

"How To Schedule Work Through a Foundry" was covered by K. Blake, Fahralloy Canada Ltd., Orillia, Ont. He described a job ticket system and the keeping of records to govern operations. To prevent scrap epidemics he suggested inspection of molds before closing and of castings after gating has been removed, after blast cleaning and after heat treatment.

Foremen at his foundry meet monthly with members of the planning control department to plan budgets and production procedures for the next month. Similar meetings are held at the end of each day to discuss the following day's work.

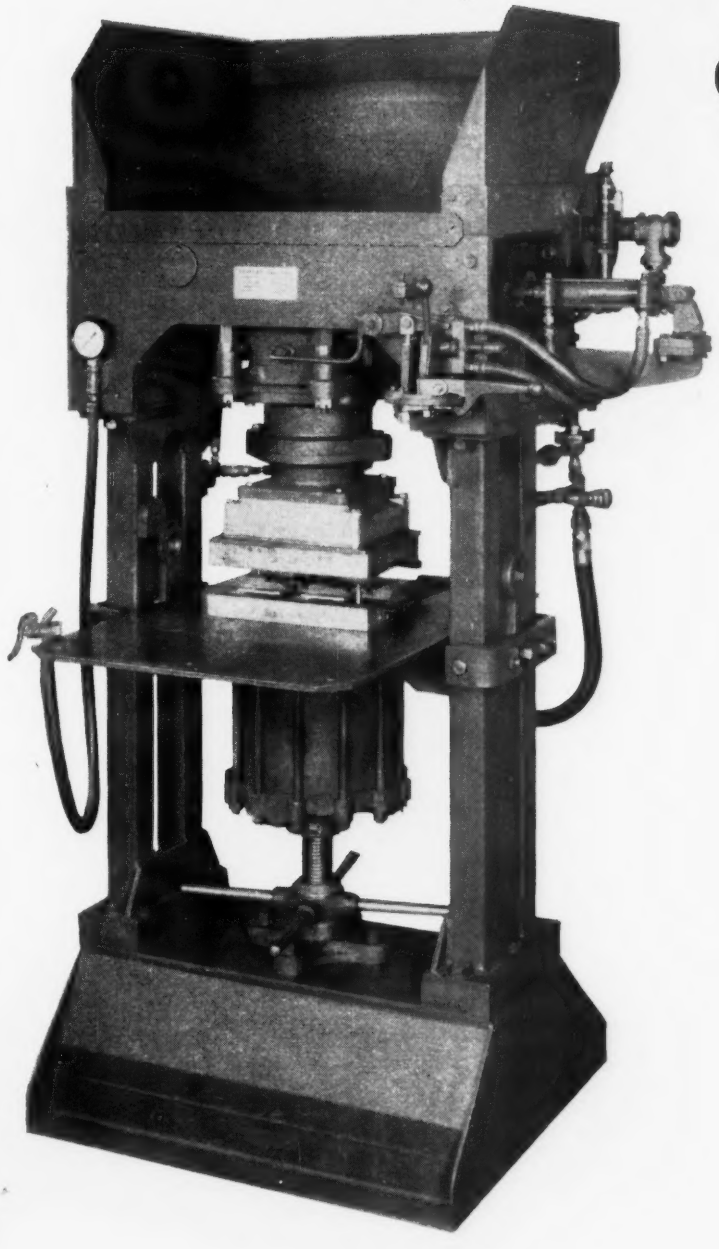
R. Gray, Canadian Westinghouse Co., Hamilton, Ont., described "How To Use Statistical Methods and Quality Control." Mr. Gray said that quality control is applicable to all size foundries. And it is not costly. A good control program requires the keeping of records, preferably in the form of charts, and proper applica-

(*Concluded on page* 204)



At left, left to right, are Claude Bourassa, chairman, Eastern Canada Chapter, AFS; F. J. Rutherford, chairman, Ontario Chapter; H. G. Robertson, regional vice president, AFS; Leslie Saunders, Toronto mayor, and Alexander Pirre, conference chairman. At right is a view of activities at the registration center

Redford No. 4-D DRAW TYPE CORE BLOWER



Designed primarily to fill the need for a fast and flexible draw type machine to handle work from a few ounces to 10 lbs., the Redford #4-D can be quickly adjusted to accommodate core boxes not requiring the draw feature, or can be equipped with a clamp to handle vertically parted core boxes.

Rugged construction, simplicity of change-overs and a fast operating cycle make it suitable for either jobbing or high production work.

Exhaust air is utilized to thoroughly fluff the sand remaining in the sand magazine after each blow, thus reducing the possibility of cratering.

The stationary sand magazine and accurately guided draw table assure perfect drawing of the cores. Vibration of the core box is automatic.

Magazine heads normally furnished with the #2 Redford machine can be used with the #4-D Redford. Larger new type magazine heads especially suited for draw type work are also available as standard equipment.

Valves are designed to assure maximum safety. The operator must use both hands at the same time in order to clamp the core box.

The Redford #4-D has been thoroughly proven in both small and large foundries. To get complete information write for Bulletin 4-D.

Redford IRON & EQUIPMENT CO.

20733 GLENDALE AVENUE • Phone KEnwood 1-8611 • DETROIT 23, MICHIGAN

(*Concluded from page* 202)

tion of the data collected.

Control should begin by checking all incoming raw materials. Sand mixtures and melting ratios then can be governed accordingly. Components of all mixtures and charges should be weighed.

Pertinent data should be recorded on a reference card for each job going out of the foundry. Important data include the pattern number, size of flask, type of molding sand, molding practice, mold hardness, the number of cores, type of core sand, metal analysis and pouring temperature.

"Cost Methods in Multi-plant Operations" were covered by J. E. Rehder, Canada Iron Foundries Ltd., Montreal. Good cost methods, according to Mr. Rehder, are a way to get bigger profits in these competitive times. Legitimate cost items are a return on money invested in plant and equipment. He cautioned against the practice of underbidding just to keep the foundry open and the men employed.

He went on to outline a number of cost-saving ideas in foundry practice, based on keeping an alert eye on raw material prices. As the market changes foundrymen can alter cupola charges, sand mixes, alloying additions, and other practices to take advantage of price reductions.

A. Deacon, quality control consultant, Brantford, Ont., concluded the session with his paper on "Use of Sampling Techniques in Jobbing Operations." Mr. Deacon emphasized the advantages of quality control in small foundries and spoke of control as a way to stop defective castings before an epidemic starts.

He described types of charts for listing data, methods of collecting and using data. He offered suggestions on how to start, introduce and operate a quality control program.

The AFS film "Effect of Gating Design on Casting Quality" was shown at the first afternoon session. Comment was by J. G. Kura, Battelle Memorial Institute. The film shows pouring tests, using water in transparent lucite molds. In addition to summarizing findings presented in two previous films it deals with the sprue base problem. Use of a well plus runner enlargement in the drag just under the sprue proved the best design in eliminating turbulence and entrapment of air into the mold.

A paper on "Pressure Molding" presented by W. R. Adams, Eastern Clay Products Dept., International Minerals & Chemical Corp., Chicago, concluded the discussion sessions. Mr. Adams listed basic requirements for high-pressure molding as: Rigid flasks large enough so that patterns are surrounded by ample sand to permit proper compaction, good sand flowability to permit dense packing and uniform distribution of squeeze pressure. In the rubber diaphragm molding machine used in high pressure molding, pressure is distributed to the sand uniformly in all directions.

In this type of molding a casting is produced identical in size to the pattern. Also fine pattern detail can be reproduced in the casting. Mr. Adams also pointed out that rat tails, scabs, buckles, etc., are minimized because of uniform mold hardness throughout the cavity.

The conference ended with a reception, banquet and entertainment at the King Edward Hotel. Frank Leahy was banquet speaker. He is the former head football coach of Notre Dame University and now executive vice president, Exothermic Sales & Service Inc., Michigan City, Ind., and Oakville, Ont.

Book Gives Safety Hints

The right and wrong way to test, mount and use grinding wheels and discs with greatest safety are presented in a new humorous cartoon-style booklet. Free copies of the pocket-size booklet, "Safety Hints in Grinding," are available from the Besley-Welles Corp., 20 North Wacker Drive, Chicago 6, manufacturer of Besley-Titan Abrasives.

Meetings of Interest to Foundrymen

Nov. 28-Dec. 3—American Society of Mechanical Engineers, annual meeting, Hotel Statler, New York

Dec. 1-3—American Institute of Mining & Metallurgical Engineers, electric furnace steel conference, Hotel William Penn, Pittsburgh

Dec. 2-7—American Society of Mechanical Engineers, 21st national exposition of power and mechanical engineering, Commercial Museum, Philadelphia

1955

Jan. 21—Malleable Founders' Society, general meeting, Hotel Cleveland, Cleveland

Jan. 24-27—Plant Maintenance & Engineering Show, International Amphitheater, Chicago. The **Plant Maintenance & Engineering Conference** will be held concurrently, also in the International Amphitheater

Jan. 24-28—American Society of Heating and Ventilating Engineers, 12th International Heating and Ventilating Exposition, Commercial Museum and Convention Hall, Philadelphia. The 61st annual meeting of the society will be held simultaneously

Feb. 10-11—Wisconsin Regional Foundry Conference, Schroeder Hotel, Milwaukee

Feb. 14-17—Industrial Ventilation Conference, Michigan State College, East Lansing, Mich.

Feb. 14-18—American Institute of Mining and Metallurgical Engineers, annual meeting, Conrad Hilton Hotel, Chicago

Feb. 17-18—Southeastern Regional Foundry Conference, Tutwiler Hotel, Birmingham

Mar. 9-10—Foundry Educational Foundation, college-industry conference, Hotel Cleveland, Cleveland

Mar. 14-15—Steel Founders' Society, annual meeting, Drake Hotel, Chicago

Mar. 26-27—California Regional Foundry Conference, Ambassador Hotel, Los Angeles

Mar. 28-Apr. 1—American Society for Metals, ninth Western Metal Congress and Western Metal Exposition, Pan-Pacific Auditorium, Los Angeles

Apr. 7-8—Malleable Founders' Society, market development conference, Edgewater Beach Hotel, Chicago

May 16-20—Sixth National Materials Handling Exposition, International Amphitheater, Chicago

May 23-27—American Foundrymen's Society, 59th annual convention, Houston, Tex.

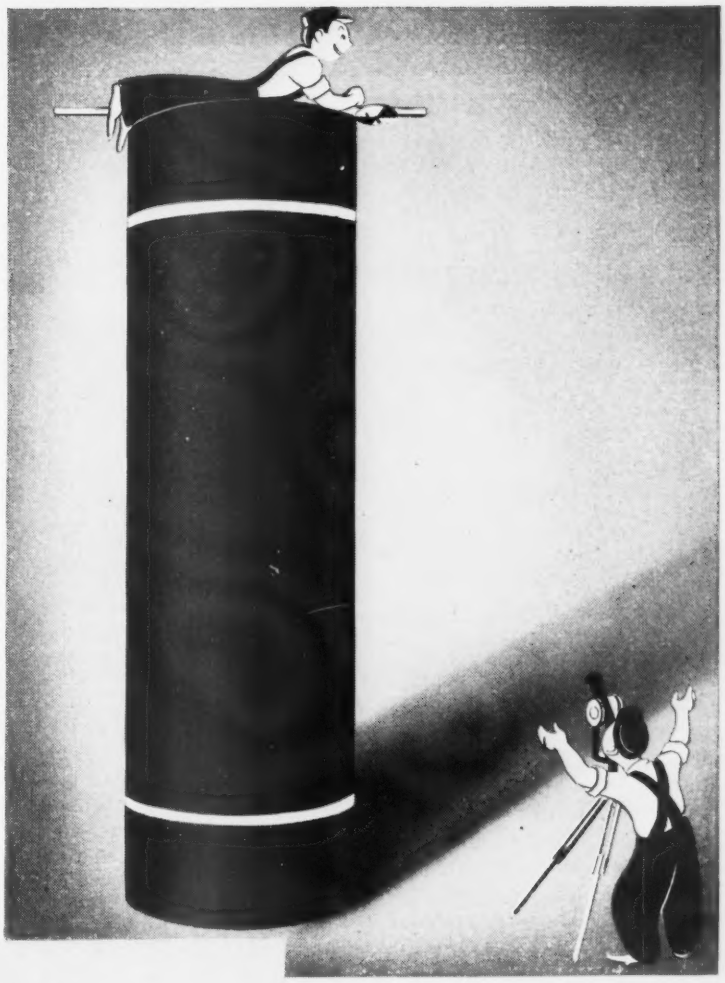
June 16-18—Malleable Founders' Society, annual meeting, The Greenbrier, White Sulphur Springs, W. Va.

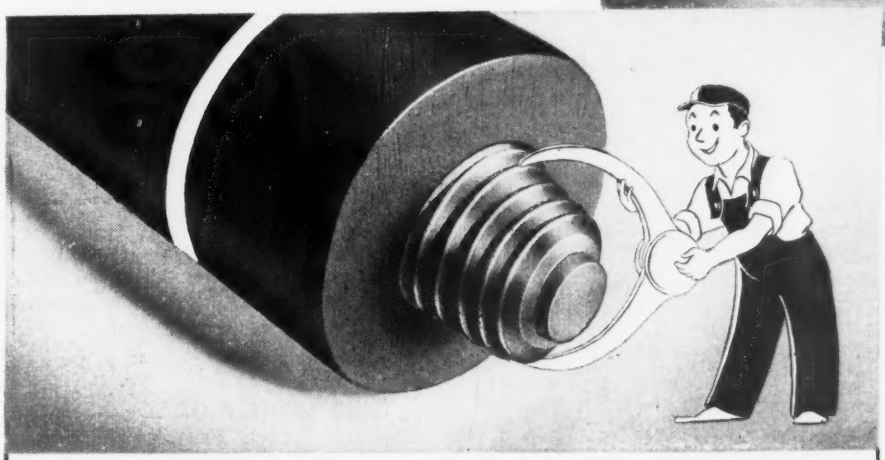
Oct. 17-18—American Coke & Coal Chemicals Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va.

Want greater Electrode Savings?

Take these tips from

NATIONAL CARBON





LOOK AT NIPPLE SIZE. Electrode nipples are another potential source of economy and improved performance. For example, if you use electrodes of 16" diameter or larger, and you are not already using the smaller nipples *pioneered by* NATIONAL CARBON COMPANY, you may be able to make this switch and save money while getting even stronger joints due to the thicker socket-walls provided by the smaller nipple sizes.

LOOK AT ELECTRODE LENGTH. Frequently we are able to direct customers to valuable economies in cost-per-pound of electrode, as well as to other cost-saving advantages, simply by recommending a longer length than they are already using. For instance, when you switch from a 60" electrode to one of 72", you reduce the number of electrodes, handled and used, by *one in six,* and, even more important, you cut down the number of joints made by the same high percentage. Obviously, this increases furnace-availability and boosts production.

• These are only two of many ways that NATIONAL CARBON'S electrode technical-service facilities have helped users get the most for their electrode dollar. Let your NATIONAL CARBON representative survey your electrode and nipple requirements. He may help you get substantial savings and improved electrode performance.

FOR ELECTRODES AND ELECTRODE SERVICE...rely on NATIONAL CARBON COMPANY!

The term "National" is a registered trade-mark of Union Carbide and Carbon Corporation

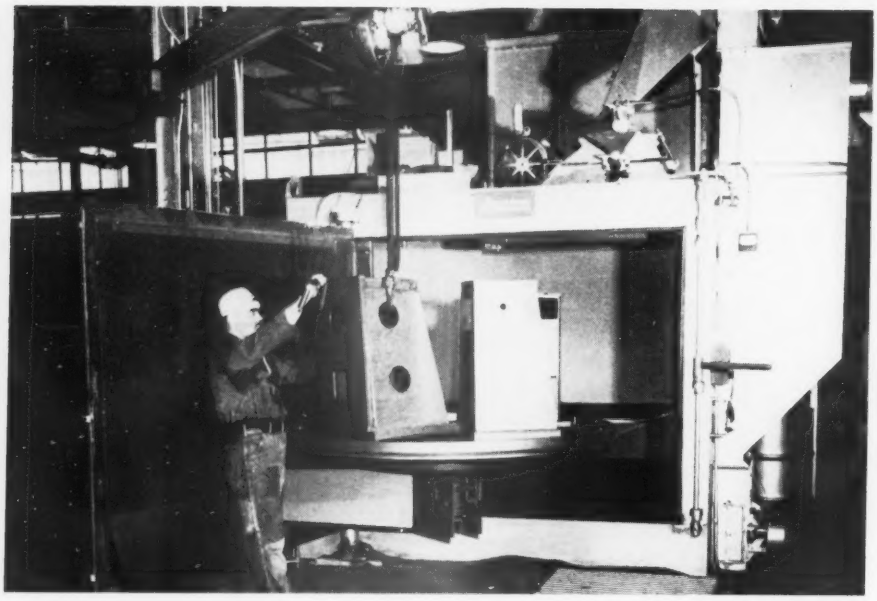
NATIONAL CARBON COMPANY

A Division of Union Carbide and Carbon Corporation • 30 East 42nd Street, New York 17, N. Y.

Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco

IN CANADA: Union Carbide Canada Limited, Toronto

NEW EQUIPMENT AND SUPPLIES



Blast Cleaner: American Wheelabrator & Equipment Corp., 1102 South Byrkit St., Mishawaka, Ind.—Table-type airless blasting machine for various cleaning and peening applications is built for floor level installation and requires no pit for the abrasive hopper. Machine has a 40-in. work height clearance. The 72-in. diam plain work table is mounted on the door of the machine. When the door is opened, the work table comes out into the room for ease in loading and unloading. When the door is shut, the table automatically moves into the blasting zone and rotates the work under the abrasive blasts from a rotating, bladed wheel mounted in the cabinet roof. No compressed air is used as centrifugal force propels the abrasive. Blasting is automatic. The operator never needs to enter the cabinet.

For More Details Circle No. 1—Page 209

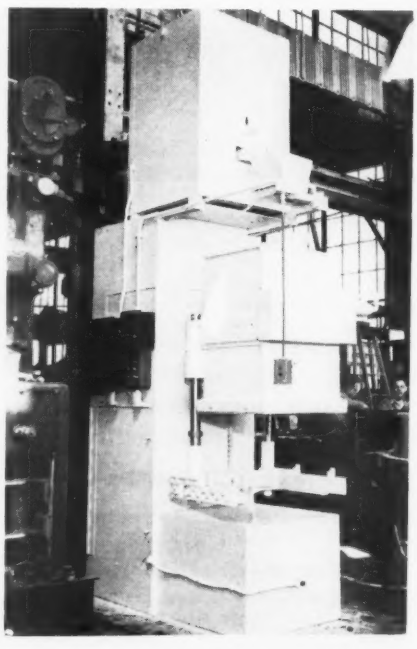
Storage Rack: Frick-Gallagher Mfg. Co., 110 South Michigan Ave., Wellston, O.—Rack with long span shelves of high load capacity is offered for storage of patterns, parts, dies, equipment or heavy material. Width of storage shelves between supporting angles is 6 ft. Heights are from 6 to 9 ft and depths 18, 24, and 30 in. Shelves are adjusted vertically on 6-in. centers.

For More Details Circle No. 2—Page 209

Smoke Density Indicator: Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa.—The density of smoke can be determined by use of an instrument that enables the observer to view a standard reference background disk, shaded to correspond with degrees of smoke density, against the background of a smoke plume. Instrument can be used to determine whether or not fuel is being properly burned to gain full Btu advantage, since excessive smoke indicates it is not.

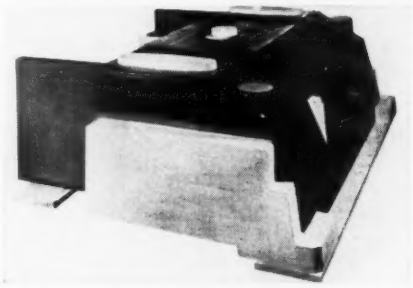
For More Details Circle No. 3—Page 209

Shell Investment Unit: Beardsley & Piper, Division Pettibone Mulliken Corp., 2424 North Cicero, Chicago 39, Ill.—Fully automatic complete-in-itself shell investment unit reportedly offers shell molders all the control features necessary for exacting production of shells up to 24 x 30 in. Unit can form up to six shells per minute but actual production will depend upon the shell curing capacity provided. Features provided include investment time control, metered sand resin addition, controlled sand resin rainfall, and lump scavenging. This shell investor is similar to the station that is part of the company's complete rotary shell units. It may be used individually with any curing and stripping equipment.



For More Details Circle No. 4—Page 209

Pattern Lumber: Kindt-Collins Co., 12653 Elmwood Ave., Cleveland 11, O. — Corisa lumber, native to South America, is now available to pattern shops. The wood is lighter than pine, but is said to be equally as strong. Being free from pitch it holds its shape better than pine, and remains dimensionally stable under adverse conditions even in thin shelled sections, the company claims. Workability is said to be good. It planes and sands easily with the grain, or end grain, carves well, takes coatings



readily, and finishes well. Available in 1, 1¼, 1½, 2, 2½, and 3 in. thicknesses, Corisa is graded according to National Hardwood Association rules, the same as those governing the grading of mahogany.

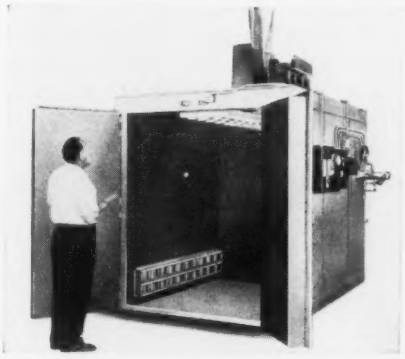
For More Details Circle No. 5—Page 290

Skid Boxes: Palmer-Shile Co., 16033 Fullerton, Detroit 27, Mich.—Corrugated skid boxes are of all-welded steel construction and can be built to any size and load capacity. Drop doors are available to permit selection of stock. Runners, stacking brackets, or crane bars can be added if specified.

For More Details Circle No. 6—Page 209

Batch Ovens: Grieve-Hendry Co., 1401-17 West Carroll Ave., Chicago 7, Ill.—Standard line of batch ovens, available with either a gas or electric heat source, are adaptable for burn-off operations as well as baking all types of finishes, preheating, drying, curing, and dehydrating. Air circulation is automatic, both horizontal and vertical, surrounding the work to assure uniform temperature. All units

For more details on these items use reply card—page 209



are shipped set up and ready to operate after local service connections are made. Electrical models range from 20 to 60 kw and gas models from 200,000 to 500,000 Btu.

For More Details Circle No. 7—Page 209

Phenolic Resin: General Electric Co., Chemical Materials Dept., Pittsfield, Mass. — Two-stage powdered phenolic resin is said to be used as dry parting agent for coreboxes, in addition to its use as a powdered bonding resin for gluing shell mold halves together by shell bonding fixtures. When used as a dry parting agent, the resin is dusted on the corebox. Picked up by the cores, the resin melts in the baking oven and hardens, thereby increasing surface hardness. As the application of the resin is done concurrently with the production of the core, the need for a separate spraying operation of water or liquid phenolic resin is eliminated.

For More Details Circle No. 8—Page 209

High Heat Lubricant: Glo Corp., 21949 South Telegraph Rd., Trenton, Mich.—Synthetic, colloidal, negatively-charged graphite solution, homogenized and partially suspended in a synthetic petroleum product that remains moist to 600° F has been used to reduce bearing seizure due to high temperatures on a roller type conveyor operating through a large, continuous, atmospheric heat treating furnace. Graphite is both inert and nonabrasive. Company engineers claim effective lubrication of any type or kind of bearings in mechanical or electrical equipment, regardless of heat, speed, load, impact or shock.

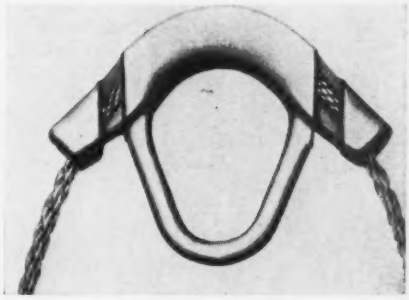
For More Details Circle No. 9—Page 209

Gyrating Screen: Simplicity Engineering Co., Durand, Mich.—Company has a W-deck screen for use on its gyrating screens. The screen reportedly permits a more even flow of material across the screen surface resulting in more screening area utilized, providing better screening of materials and increasing screen life by uniform wear. The screen features side and center tension take-up only. Maximum opening utilized is 2 in. with a maximum wire size of ⅜-in.

For More Details Circle No. 10—Page 209

Electric Plant: Kohler Co., Kohler, Wis. — Gasoline-powered alternating current electric plant develops 15 kw and features a large radiator, belt-driven centrifugal pump and blower fan, adjustable jet carburetor with automatic choke, and a mechanical fuel pump with oil bath air filter. Six different models with remote control or standby starting, and with varying voltage outputs are available. A carburetor and valve kit for converting the fuel supply to natural or artificial gas can be supplied. Six cylinder engine produces 51 hp at 1800 rpm and has a 3½-in. bore and a 3¾-in. stroke.

For More Details Circle No. 11—Page 209



Sling Bridle: Newman Mfg. & Sales Co., P.O. Box 5939, Kansas City 11, Mo.—Sling bridle features a tapered groove that grips the sling to prevent load slippage even when load is unbalanced, according to the manufacturer. The bridle takes the wear from crane and hoist hooks and reportedly lengthens the life of the sling by avoiding sling kinks and abra-

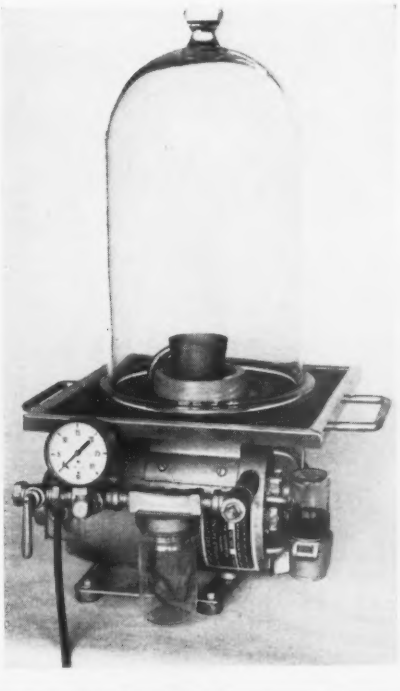
Gas Detector Highlights Metal Porosity

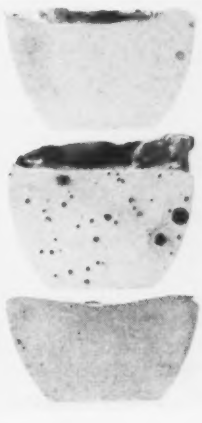
UNDER ordinary atmospheric pressure, aluminum castings may solidify so the gas, in coming out of solution, produces tiny cavities too small to see. Thus a casting may appear sound when cut or machined and yet be low in strength and ductility, or may leak under pressure. By freezing a small test casting in a crucible under reduced pressure any gas present is caused to expand into large cavities which can be seen readily on sectioning. This gas detecting unit (below, left) is for use with aluminum alloys and can be set up as a permanent installation near melting or pouring stations or used as a portable unit.

In the test samples below, the section on top is shown before degassing. Sample in center is same as on top but is shown after freezing in the degassing unit. Sample at bottom is same sample again, but after proper degassing.

Overall dimensions of the unit are 22½ in. high x 13½ in. wide. It normally is supplied for use with 110 v, 60 cycle current but units are available to suit other electrical requirements. The apparatus is manufactured by Exomet Inc., Conneaut, O.

For More Details Circle No. 12—Page 209



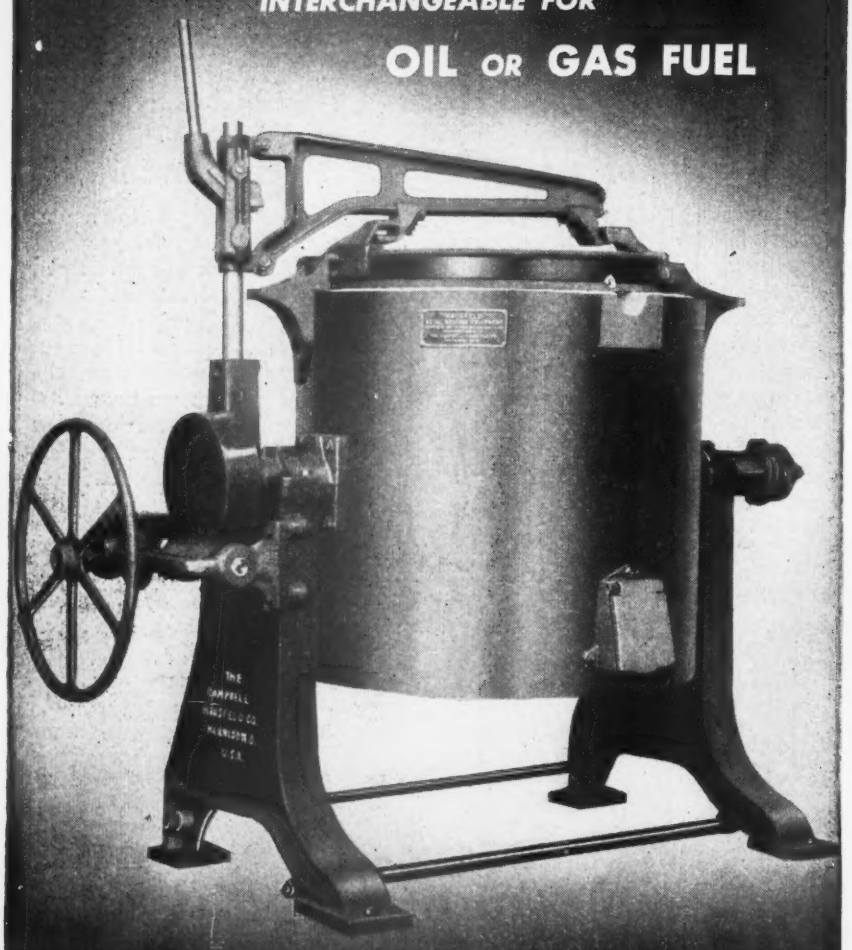


HAUSFELD

A FURNACE FOR EVERY NON-FERROUS MELTING REQUIREMENT

INTERCHANGEABLE FOR

OIL OR GAS FUEL



Built for Service

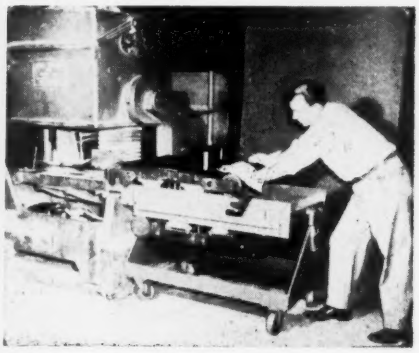
The Campbell-Hausfeld Co.

300-320 MOORE ST. HARRISON, OHIO

sion. The design converts a standard single part sling to a two-leg bridle sling.

For More Details Circle No. 13—Page 209

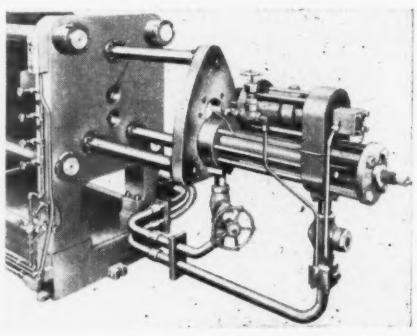
Pattern Dolly: Shell Process Inc., 340 McKinstry Ave., Chicopee, Mass.—Pattern carriage changeover dolly is said to simplify and speed pattern changeover and eliminate bull



work when getting pattern carriages on and off shell mold machines. Dolly is lined up with end of machine track. New pattern is in upside down position on underside of carriage. Old pattern is pulled to top side of carriage. A stop limits travel of the carriage and retaining lugs prevent it from falling off. Carriage is rolled over and new pattern rolled in place on machine track.

For More Details Circle No. 14—Page 209

Pressure Intensifier: Cast-Master Inc., 2123 Hamilton Ave., Cleveland 14, O.—Shot pressure intensifier is engineered to operate without the use of valves to permit a simul-

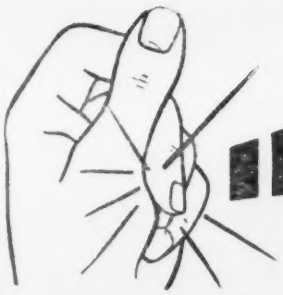


taneous build up without hesitation from normal line pressure to intensified pressure. The unit is designed for use on any of the company's cold chamber model die casting machines without extensive modification. Manufacturer says use of the new equipment results in denser castings, having a finer molecular structure with a better surface finish.

For More Details Circle No. 15—Page 209

Couplings: Snap-Tite Inc., 201 Kelly St., Union City, Pa.—Couplings suitable for high pressure and heavy surge applications are available in

(*Continued on page* 211)



IDEAS FOR FOUNDRYMEN

HERE ARE QUICK REVIEWS OF NEW LITERATURE—available to foundrymen as "idea" and reference information. Readers in the United States and Canada may obtain copies by using the attached cards. Readers in foreign countries should write direct to the manufacturer offering literature.

81. Induction Furnaces

Ajax Electrothermic Corp., Ajax Park, Trenton 5, N. J.—Bulletin 14-B illustrates converter type induction furnaces in pictures and text. Advantages of induction melting are listed, a table of melting performances for various metals is included as well as dimensioned drawings of various capacity furnaces.

82. Foundry Practice

Foundry Services Ltd., Long Acre, Nechells, Birmingham 7, England—Technical service publication for July-Aug. of *Foseco Foundry Practice* covers gross porosity in tin-bronze casting, faults in casting design and exothermic feeding of iron castings.

83. Core Blower

Redford Iron & Equipment Co., 20733 Glendale, Detroit, Mich.—Features and specifications of a core blower for cores weighing from a few ounces to 10 lb are contained in bulletin 4. Machine is pictured in operation.

84. Crucible Charging

Crucible Manufacturers' Association, 27 William St., New York 5, N. Y.—Charging and melting are discussed in folder No. 2 of a series on crucible melting. Tips for longer crucible life are included.

85. Refractory Coatings

Thiem Products Inc., 9800 West Rogers St., Milwaukee 14, Wis.—High refractory core and mold coatings are described in an illustrated leaflet. Other products are listed.

86. Space Heaters

Dravo Corp., Heating Dept., Machinery Division, Dravo Bldg., Fifth and Liberty Ave., Pittsburgh 22, Pa.—Specifications, application features and description of forced air, direct-fired space heaters are found in bulletin 523-B. They are equipped with gas or oil burners or combination burners.

87. Dust Collectors

Newcomb-Detroit Co., 5741 Russell St., Detroit 11, Mich.—Engineering data, dimensions and application photographs of dust collectors are given in bulletin D-53-30. Shakeout booths and downdraft bench collectors for magnesium, aluminum and hazardous dusts are shown.

88. Oil Burners

Thermal Research & Engineering Corp., Conshohocken, Pa.—High velocity oil burners for use in ladle heating are described in bulletin 107. Operating principles, applications, dimensions and output data are included.

89. Bridge Cranes

Michigan Crane & Conveyor Corp., 115 North McKinstry Ave., Detroit 9, Mich.—Bulletin 154, containing general specifications and application data, covers single girder, double girder and box girder cranes.

90. Chrome-Magnesia Mix

Basic Refractories Inc., 845 Hanna Bldg., Cleveland 15, O.—Advantages and uses of a chrome-magnesia base refractory designed for gun emplacement are listed in bulletin G-101.

91. Furnace Trays & Boxes

Standard Alloy Co., 1679 Collamer Rd., Cleveland 10, O.—Furnace tray, box and fixture designs of heat resisting alloys are featured in bulletin No. 6.

92. Copings and Gravel Stops

Aluminum Co. of America, 739 Alcoa Bldg., Pittsburgh 19, Pa.—Copings, gravel stops and other alu-

SUBSCRIBERS IN FOREIGN COUNTRIES—please note:

We regret that owing to postal and mechanical problems over which we have no control, we are able to process literature requests mailed in the *United States and Canada only* until further notice. We suggest that you write direct to the manufacturer for product information at the addresses given in advertisements and literature descriptions.

→ GOOD IN THE UNITED STATES AND CANADA ONLY ←

12-54

FOUNDRY
Penton Building, Cleveland 13, Ohio

Please send literature or detailed information on subjects circled at left to—

NAME _____ TITLE _____

COMPANY _____

PRODUCTS MANUFACTURED _____

ADDRESS _____

CITY and STATE _____

Card MUST be completely filled out. Please TYPE or PRINT

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
Cleveland, Ohio

BUSINESS REPLY CARD
No Postage Stamp Necessary If Mailed in the United States

4c POSTAGE WILL BE PAID BY

FOUNDRY
Penton Building
Cleveland 13, Ohio

Readers' Service Dept.

minum roofing accessories are described in an 18-page booklet. Illustrations, specifications and performance records are included.

93. Core & Mold Washes

United States Graphite Co., Division of the Wickes Corp., Saginaw, Mich.—Engineering bulletin 17 describes mold and core washes. Suggested baumes for various applications are listed and a baume water requirement guide is included.

94. Refractory Applicator

True Gun-All Equipment Co., 122 North Kirkwood Rd., St. Louis 22, Mo.—Bulletin GA 853 describes a double chamber refractory applicator available with either gasoline engine or electric motor. Complete specifications are given.

95. Air Compressors

Curtis Pneumatic Machinery Div., Curtis Mfg. Co., St. Louis 20, Mo.—Features, specifications of both single stage and two stage compressors are listed in catalog C-100. Illustrations, sectioned views and text all add to the explanation.

96. Foundry Equipment

Sutter Products Co., 2005 Westwood Ave., Dearborn, Mich.—Data file of foundry equipment includes bulletins on shell molding, molding machines, core blowers and sand mixing machines. Each bulletin is illustrated.

97. Dielectric Core Drier

Allis-Chalmers Manufacturing Co., General Machinery Div., Milwaukee 1, Wis.—Commonly asked questions about dielectric sand core drying are answered in bulletin 15B7306C. Important features of the core drier and its operation are illustrated.

98. New Molding Machine

Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh 22, Pa.—Operation, features, specifications and drawings of a new two-station indexing type jolt, squeeze, strip machine are given in catalog JSI-2-54.

99. Cranes

Euclid Crane & Hoist Co., Cleveland 17, O.—Cranes from 1 to 100 tons capacity are covered in an illustrated booklet. Trolley design, bridge and end construction, controls and types of cabs are explained.

100. Casting Impregnation

American Metaseal Mfg. Corp., 607 65 St., West New York, N. J.—Method of achieving complete impregnation of porous castings is graphically illustrated in photographs of batch immersion equipment for the rapid treatment of large quantities of parts. Brochure includes tables giving properties of the impregnant and the corrosives it will resist.

101. pH Indicator

Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.—New panel-mounted indicator for continuous measurement of pH or redox in manufacturing processes is described in a data sheet, ND42-96(1).

102. Cleaning Costs

American Wheelabrator & Equipment Corp., 949 South Byrkit St., Mishawaka, Ind.—Bulletin 103D gives case history of eight foundry changes in cleaning room equipment. Production rates and savings are listed.

103. Aluminized Clothing

American Optical, Safety Products Division, Southbridge, Mass.—Aluminized asbestos and duck clothing for radiant heat protection is described in an illustrated folder. Each article of clothing is pictured.

104. Ball Bearing Trolleys

Link-Belt Co., 307 North Michigan Ave., Chicago 1, Ill.—Book 2536 includes dimension data, application data, a description of commonly used attachments and pictures of a new line of ball bearing trolleys.

105. Blast Cleaning

Alloy Metal Abrasive Co., 311 West Huron St., Ann Arbor, Mich.—Principles of blast cleaning, size selection and stabilization of shot, operating features and shot quality are discussed in a manual.

106. Conveyor Lubricators

J. N. Fauver Co., 51 West Hancock, Detroit 1, Mich.—Catalog CL849 describes oil and grease lubrication units for ordinary or high temperature applications of conveyors.

107. Vacuum Melted Metals

Carboloy Department, General Electric Co., Detroit 32, Mich.—Information and technical data on vacuum-melted metals and alloys are included in technical bulletin VM-100.

108. Flask Pins & Bushings

Universal Engineering Co., Frankenmuth, Mich.—Illustrations, dimensioned drawings and tables cover many types of standard pins and bushings in catalog F-1030.

109. Pneumatic Conveying

Convair, Pittsburgh, Pa.—Vacuum, vacuum pressure and pressure conveying systems are illustrated by engineering drawings in Bulletin 105.

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States
4c POSTAGE WILL BE PAID BY—
FOUNDRY
Penton Building
Cleveland 13, Ohio
Readers' Service Dept.

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
Cleveland, Ohio

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210

→ GOOD IN THE UNITED STATES AND CANADA ONLY ←
FOUNDRY
Penton Building, Cleveland 13, Ohio
12-54

Please send literature or detailed information on subjects circled at left to—

NAME _____ TITLE _____
COMPANY _____
PRODUCTS MANUFACTURED _____
ADDRESS _____
CITY and STATE _____
Card MUST be completely filled out. Please TYPE or PRINT

The case of the arching soap chips...

No amount of sweat and tears in a Detroit soap plant seemed to keep production moving smoothly. Arching soap chips clogged up the bins and hoppers and brought everything to a standstill.

That is, until a CLEVELAND vibrator was installed and got things back into full swing again.

There's no limit to the range of materials a CLEVELAND will move. Our detailed literature will describe the vibrator for your problem.

AIR *and* ELECTRIC

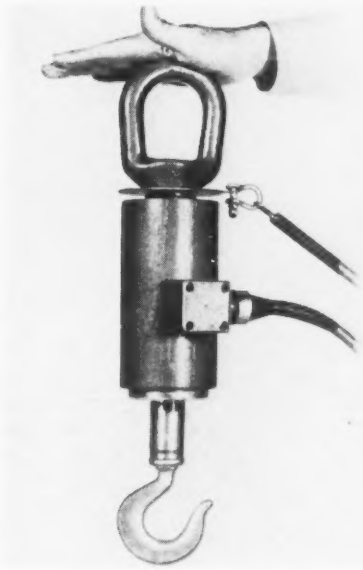
2788 Clinton Avenue • Cleveland 13, Ohio

(*Continued from page* 208)

⅛ to 10-in. ID sizes. Metal to metal valve stop in the closed position permits positive control of the compression of the valve washer sealing member, according to the manufacturer. A barrel spring, with a perforated "spider," full circle valve stop and guide, holds valves steady in open position, allowing no valve float, and permits high pressures and surges in both directions through the coupling or rapidly pulsating surges in both directions. High tensile strength alloy steel is standard in the coupling but they can be made in a variety of stainless steels and nonferrous materials to meet unusual conditions.

For More Details Circle No. 16—Page 209

Crane Scales: Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.—Company has added three small capacity crane scales to its line to



increase the number to six ranging from ½ to 25 tons. New sizes are ½, 1¼ and 2½-ton models. Others are 5, 12½, and 25 tons. Direct reading load indicating instruments may be mounted in crane cabs, on carts, or in stationary positions. Cable reels provide freedom of movement of scales. High overload capacity protects calibrations of the units. Overall length ranges from 18½ in. for the ½-ton unit to 5 ft for the 25-ton unit.

For More Details Circle No. 17—Page 209

Pallet Stacker: Beacon Machinery Inc., P.O. Box 188, East St. Louis, Ill.—Pallet dispenser and stacker consists of a raising and lowering mechanism and a magazine to hold a quantity of pallets. It may be placed at any production line point, where empty pallets are required, or at any shipping dock where incoming freight is to be palletized. The unit will dispense a single empty pallet either

Unload 2 tons with 1 hand

It's easy with a Roura Self-Dumping Hopper. Simple, one-man operation does it with amazing speed . . . *cuts cost of hand unloading by at least 50%*. That's why hundreds of leading industries have found it the safe, sensible, economical way to handle wet or dry, hot or cold bulky materials.

It fits securely on any standard fork or platform lift truck . . . turns it into an efficient, semi-automatic dump truck. And, remember . . . Roura makes 'em rugged . . . extra heavy gauge welded construction . . . to withstand years of toughest treatment. They're available in sizes from ½ to 2 cubic yards.

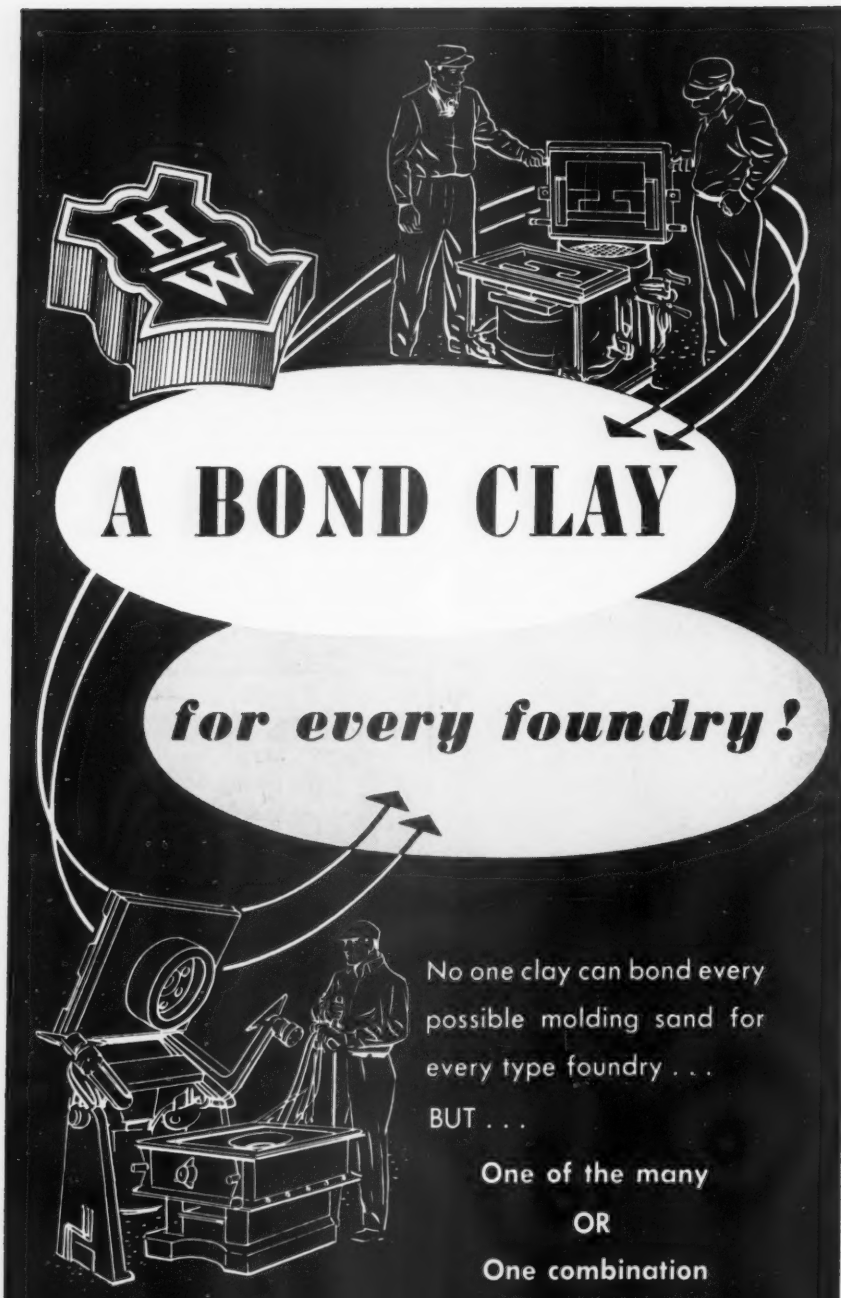
Let Roura help *you* cut costs.

ROURA
Self-Dumping
HOPPER

WANT DETAILS?

Clip this coupon . . . attach it to your letterhead . . . sign your name . . . and mail to . . .

ROURA IRON WORKS, INC.
1417 Woodland Ave., Detroit 11, Michigan


A BOND CLAY
for every foundry!
No one clay can bond every possible molding sand for every type foundry . . .
BUT . . .
One of the many
OR
One combination

of the many clays produced by Eastern Clay Products will fit your specific needs.

Regardless of price, you can't buy better Western Bentonite, Southern Bentonite, Fire Clay or Special High Flowability Bonding Clays than those sold by us.

We invite your inquiries.

Hickman, Williams & Co.

(INCORPORATED)

CHICAGO · DETROIT · CINCINNATI · ST. LOUIS · NEW YORK
CLEVELAND · PHILADELPHIA · PITTSBURGH · INDIANAPOLIS

Established 1890

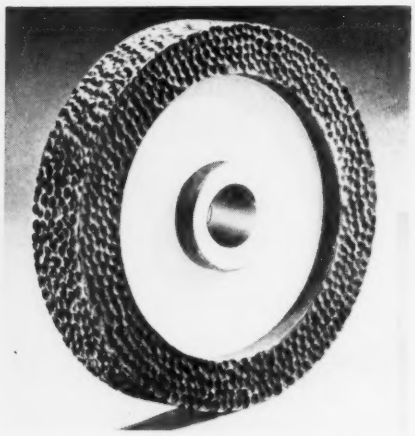
onto a conveyor or in any other manner convenient to workman. Fork trucks are used to load the dispenser and unload the stacker. Equipment is

readily adaptable to any type of automatic control. Space required is a few inches larger than the dimensions of the pallet being used.

For More Details Circle No. 18—Page 209

Cutting Wheels: Schmidgall Mfg. Co., 307 Cass St., Peoria 2, Ill. —Wheels for grinding nonferrous metals are made of tempered, high-grade steel and according to the manufacturer, will not clog, thus eliminating wheel dressing. Thousands of small pits machined into the surface are said to give the same results as grinding or emery wheels.

After long usage the wheels are reversible which gives double life. When the wheels are dull, reconditioning can be done at nominal cost. While in operation the size of the



wheel remains constant. Manufacturer claims the design of the wheels permits many operations not possible with standard grinding and emery wheels. Wheels are made in all standard sizes and arbors.

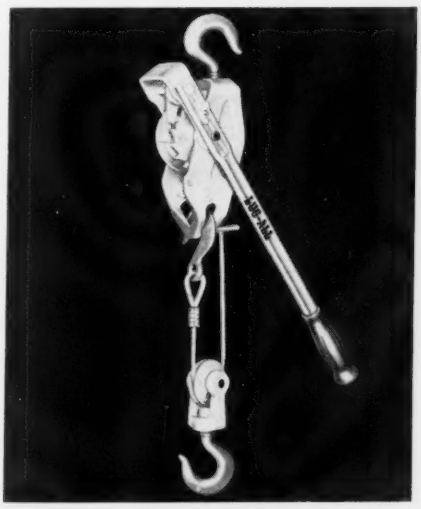
For More Details Circle No. 19—Page 209

Air Gun: Milwaukee Air Gun Co., 2624 North 56th St., Milwaukee, Wis. —Heavy duty air pressure gun re-

portedly can be used under almost every condition where easily and fully controlled air pressure is needed. Construction uses one moving part and metal-to-metal valve and seat. Nozzle provides a high volume air supply at a low velocity. Standard tips are available in any length up to 48 in. Special nozzles can be provided to specification. Standard curved nozzle is nonturning with collet.

For More Details Circle No. 20—Page 209

Winch Hoist: Lug-All Co., 331 East Lancaster Ave., Wynnewood 24, Pa.—Portable winch hoist weighs 9 lb but is said to handle up to 1½ ton. It is equipped with a reversible safety handle that will bend when extreme overloads are applied. Loads can be backed off safely by an interlocking pawl arrangement, according to the manufacturer. Other features include stainless steel springs, oiled-for-life



bearings, and a 133-strand flexible preformed aircraft cable that winds on the drum and out of operator's way.

For More Details Circle No. 21—Page 209

Hose Valves: P-K Industries Inc., 27 Porete Ave., North Arlington, N. J.—Company's line of industrial rubber covered hose valves is designed for wash down and tank filling applications in batch processing operations where periodical cleansing of tanks is required. Body and working parts are stainless steel for corrosion resistance. Valve has two moving parts with no springs or lever mechanisms. Valve is 5 in. long, weighs 1 lb and will fit any standard ½, ¾, or 1-in. standard ID hose.

For More Details Circle No. 22—Page 209

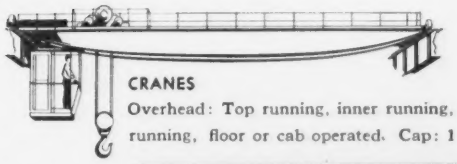
Spectrometer: Jarrell-Ash Co., 26 Farwell St., Newtonville, Mass.—Direct reading spectrometer is said to incorporate new electronic, optical and mechanical design innovations. Instrument has a double optical system and focal deck so that it may be

When only a CRANE will do...

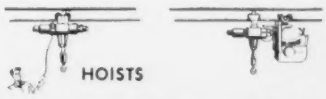
Consult SHEPARD NILES

OVER 50 YEARS EXPERIENCE
Shepard Niles has specialized in designing and constructing cranes since 1903. Over 50 years experience—serving all types of industry—goes into every Shepard Niles Crane!

COMPLETE CRANE CONSTRUCTION
All component parts are designed and manufactured by Shepard Niles specifically for crane operation—your guarantee of dependable service, backed by maintenance control second to none!



CRANES
Overhead: Top running, inner running, under running, floor or cab operated. Cap: 1 to 450 tons.



HOISTS
Operated from cab, floor or pulpit. Cap: 1 to 20 tons.

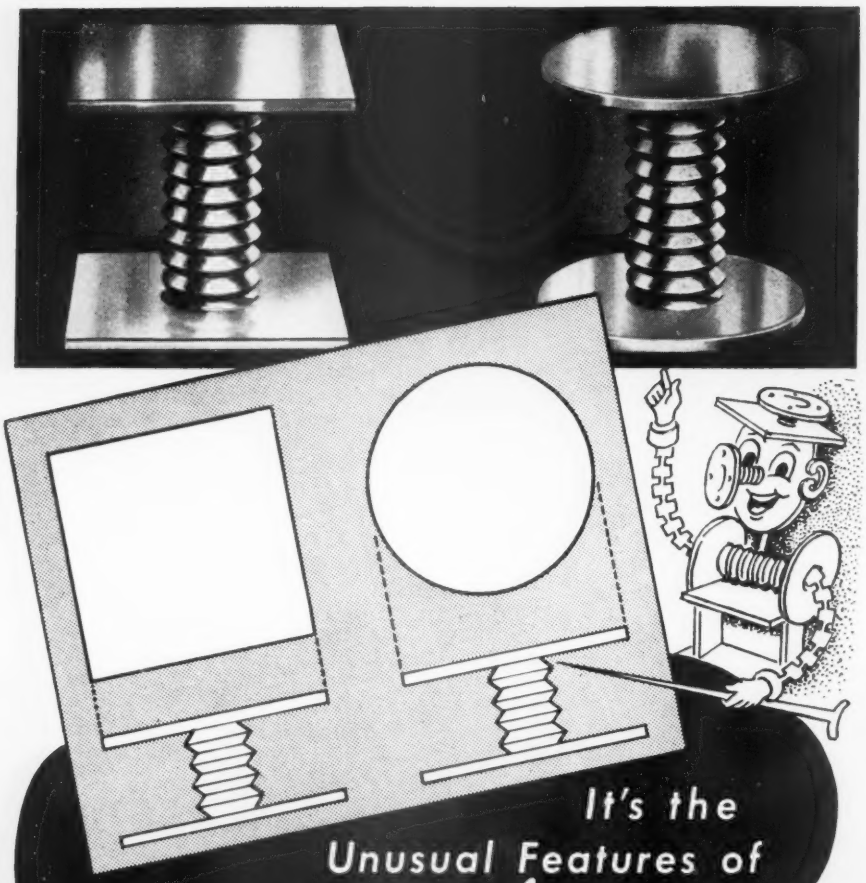
SHEPARD NILES
CRANE AND HOIST CORPORATION

MAIL THIS COUPON

SHEPARD NILES CRANE and HOIST CORPORATION
1344 Schuyler Ave., Montour Falls, N.Y.

( ) *Please send me your latest Crane Bulletin.*
( ) *Please have a representative call.*

NAME _____ TITLE _____
COMPANY _____
STREET _____
CITY _____ STATE _____



It's the Unusual Features of

Milwaukee CHAPLETS

that Insure Instant Fusing in any Casting

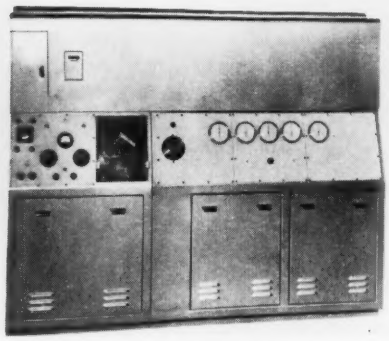
It's the sharply cut "thread stem" design that insures instant fusing. Metal melts at the edges first, that's why the sharp edges "burn in" quickly and completely to insure instant fusing which results in freedom from leakers. As the fusing cycle slows up through the base of the thread and into the stem itself, there is ample time for adequate and proper core support. Here is a design where fusion takes place at exactly the right speed to give you both instant fusion plus proper core support.

Write for Samples and Prices

Milwaukee Chaplet & Mfg. Co.

1025 SOUTH 40th STREET • MILWAUKEE 4, WISCONSIN

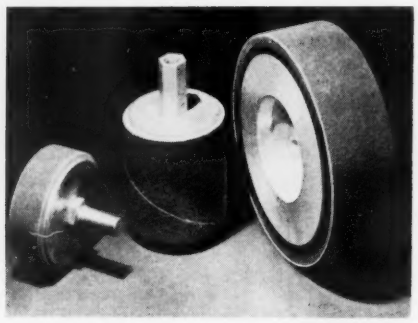
used photographically for qualitative or semiqualitative analysis, simultaneously with or alternatively to the direct reading measurements. It can



be furnished as a single deck reading system for use in analysis of simple steels and cast iron. Complete analyses normally require less than a minute. Results reportedly show standard deviations of 1 to 2 per cent. Cabinet housing is 43¾ x 81¼ in.

For More Details Circle No. 23—Page 209

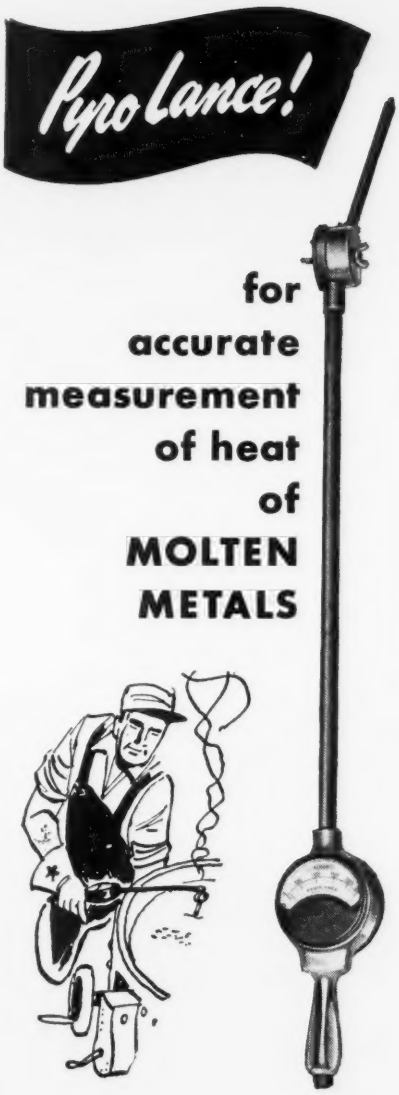
Abrasive Band Wheels: Even-Cut Abrasive Band Co., 8212 Carnegie Ave., Cleveland 3, O.—Rubber cushioned abrasive band wheels consist of a plated alloy steel shaft with flanges holding a specially fabricated rubber wheel. Abrasive bands are slipped over the wheel. As flanges



are tightened, the resulting squeezing action holds the band in position and permits fast, accurate cutting or polishing without use of excessive pressure, the manufacturer claims. Wheels can be furnished in over 50 sizes from ¼-in. diam x ½-in. width to 6-in. diam x 2-in. width. Matching abrasive bands are available in open, closed and spaced grain coatings in aluminum oxide, silicon carbide, and garnet in grits from 24 to 400.

For More Details Circle No. 24—Page 209

Float Units: Wilkerson Corp., 3367 South Platte R. Dr., Englewood, Colo.—Snap action automatic float units are for separating moisture and other contaminants from compressed air lines. They are designed for either continuous or intermittent flow lines and are claimed to operate without pressure or flutter. Stock sizes are



For quick, accurate temperature readings of molten metals, operators of non-ferrous foundries everywhere are relying on the Alnor Pyro Lance. Portable, handy to use, the Pyro Lance has a protected thermocouple, with adjustable angle head, mounted in the lance tip. It takes temperature below the surface—unaffected by dross or other conditions. Here's an easily handled instrument to help control quality in the foundry. For complete information and prices on this valuable instrument write for Bulletin No. 1724-D. Illinois Testing Laboratories, Inc., Room 511, 420 N. LaSalle St., Chicago 10, Illinois.

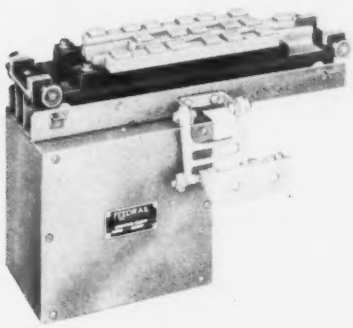
Alnor

PRECISION INSTRUMENTS FOR EVERY INDUSTRY

available for ¼ to 3 in. lines. Almost any volume of air can be accommodated. Operating pressures are 10 to 250 psig.

For More Details Circle No. 25—Page 209

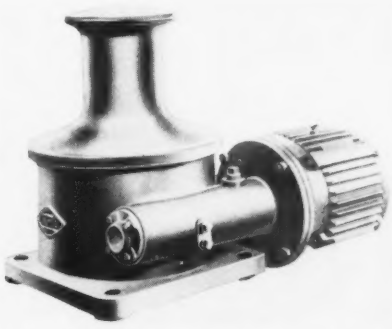
Trolleys: Feedrail Corp., 125 Barclay St., New York 7, N. Y.—Two heavy duty trolleys rated at 375 amperes, two pole and three pole, are designed for speeds up to 300 fpm in facilitating the movement of heavy tonnage cranes, portable welding apparatus and other electrical equipment having motor loads up to 200 hp at 440 v, ac. Both trolleys are track supported. They are factory assembled and ready for immediate use by connecting the load line to the



solderless type pressure connectors within the terminal box. A mechanical polarizing stop is built in to insure proper polarity when trolleys are inserted in the track.

For More Details Circle No. 26—Page 209

Car Puller: Clyde Iron Works, Duluth 1, Minn.—Capstan-type car puller features antifriction bearings and drip proof housing that encloses all gearing. Gears run in an oil bath. Unit is compact for installation between track or for working in congested areas. Two sizes are available: One with capacity for 5000 lb starting line pull and 2000 lb running line

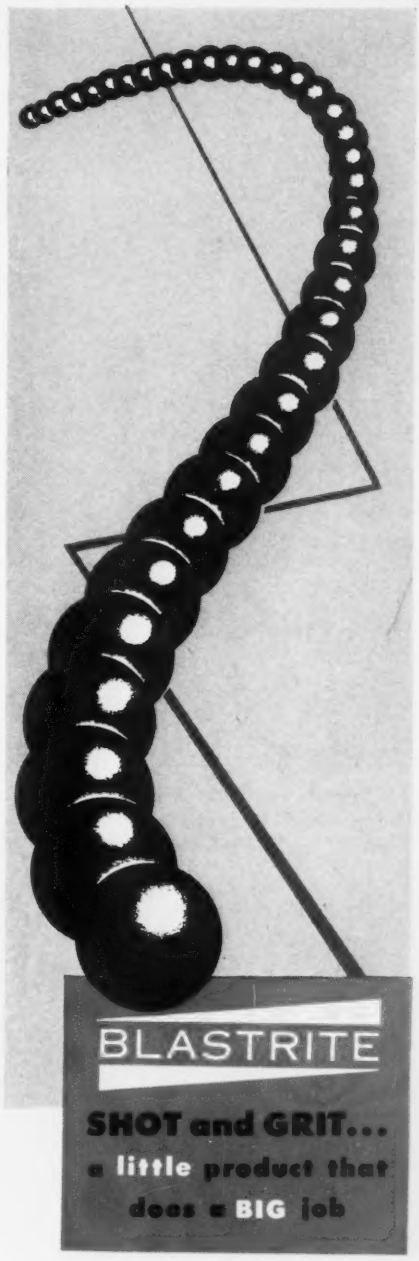


pull; the other with capacity for a 10,000 lb starting line pull and 4000 lb running line pull.

For More Details Circle No. 27—Page 209

Die Casting Machine: Hydraulic Press Mfg. Co., Mt. Gilead, O.—Newly designed cold chamber, high

(*Continued on page* 218)



For high quality, longer wear, greater economy, specify Blastrite for your abrasive requirements. It comes in a complete range of standard sizes or in special, made-to-order sizes if needed for your particular operation.

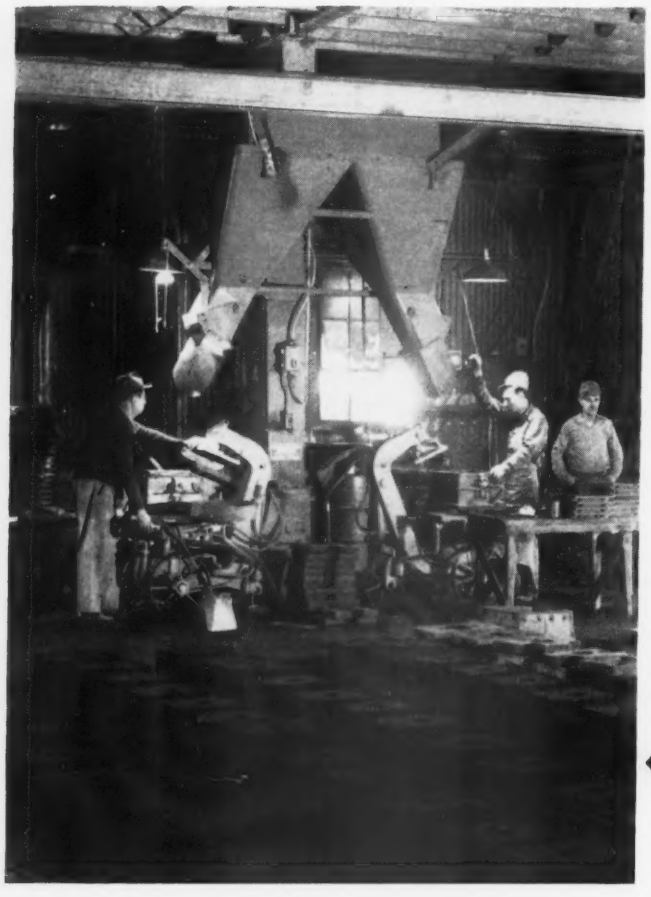
Our new catalog No. AB-53 will give you further details.

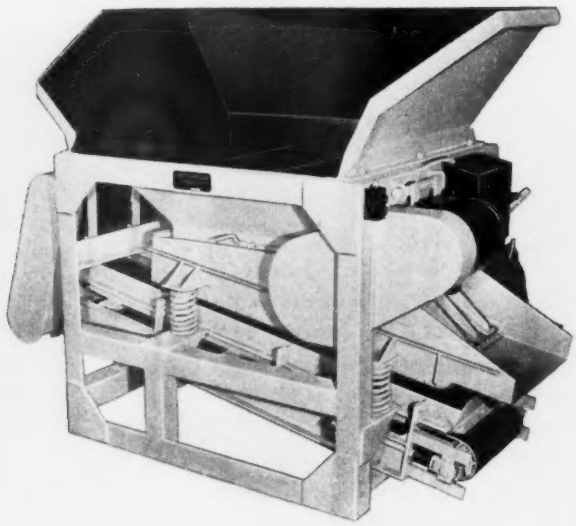
ABRASIVE SHOT & GRIT CO., INC.
SPRINGVILLE, N.Y.
Telephone Springville 1

(Advertisement)

FOUR MEN handle all of the molding operations for eight cope and drag stations on this above-floor B&P Rotomold unit at the American Foundry & Machine Co., Salt Lake City, Utah. Cope and drag patterns for each job are mounted on a single pattern board at eight roller conveyor stations on the Rotomold table. The Stationary Sandslinger rams any number of different jobs. *Write for full information to Beardsley & Piper, Div. Pettibone Mulliken Corp., 2424 N. Cicero Avenue, Chicago 39, Illinois.*

Cost-Cutting Equipment in the News



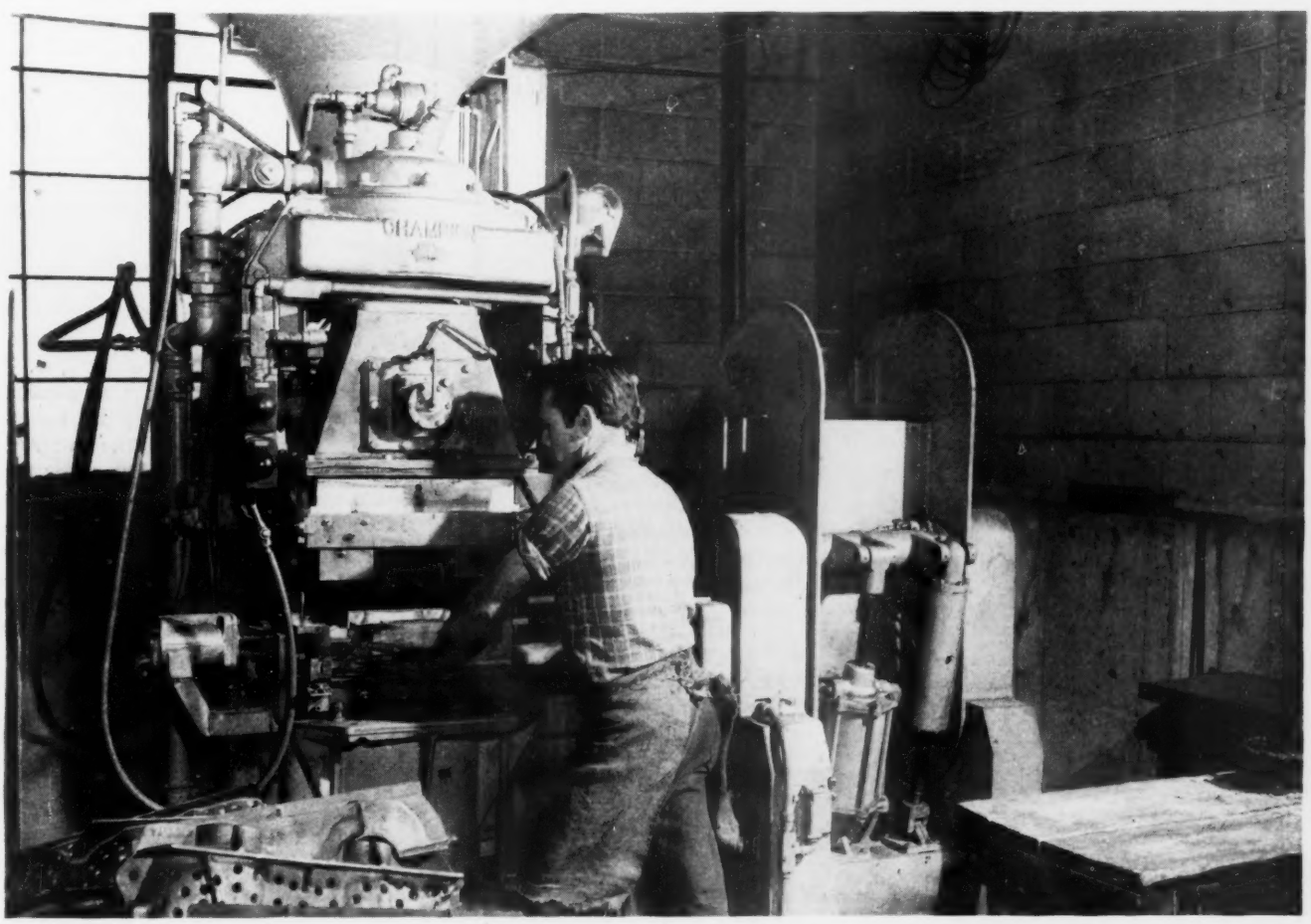


THE NEW ABOVE-FLOOR Model "60" Preparator, introduced by Beardsley & Piper, has greatly simplified the installation of Speedmullor-Preparator units. The installation costs of these complete sand conditioning and mulling units is now lower than ever. *Write to Beardsley & Piper, Div. Pettibone Mulliken Corp., 2424 N. Cicero Avenue, Chicago 39, Illinois for full information and prices.*

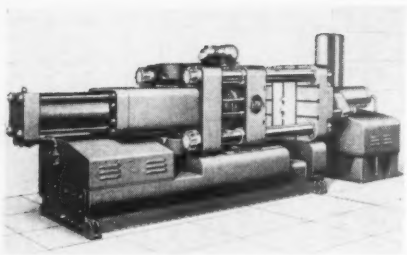
SMALL SIDE FLOOR WORK is handled efficiently at the Empire Pattern & Foundry Co., Tulsa, Oklahoma on two inexpensive J&J Portable Jolt-Squeezers. Rammed molds are set out on the floor for pouring. *Full information on J&J machines may be obtained by writing to Beardsley & Piper, Div. Pettibone Mulliken Corp., 2424 N. Cicero Avenue, Chicago 39, Illinois.*

AUTOMATIC CONTROL of sand preparation has been further simplified and refined by a new Skiptrol device. Skiptrol, introduced by Beardsley & Piper, accurately controls loading of the Speedmullor skiphoist bucket. The diaphragm pressure switch located in the skiphoist bucket is shown here. Skiptrol is one of a complete line of automatic controls manufactured by B&P. These include Mulltrol, Mulltrolmatic, Blomatic, and Cormatic. *New detailed information on Skiptrol is obtainable from Beardsley & Piper, Div. Pettibone Mulliken Corp., 2424 N. Cicero Avenue, Chicago 39, Illinois.*

ALL OF THE CORES required for operations at the Belnap Manufacturing Co., Bridgeport, Connecticut are made from core sand thoroughly mulled in this Model 3½ Mulbaro. Belnap, manufacturers of an outstanding line of valves, depends on this Mulbaro, Speedmullors and a Swingslinger in their very efficient foundry. *For more information write to Beardsley & Piper, Div. Pettibone Mulliken Corp., 2424 N. Cicero Avenue, Chicago 39, Illinois.*



OVER 1400 forty pound double transmission cores are produced each day on this Champion Cormatic Unit at the Newnam Foundry, Kendallville, Indiana. The core sand for this exacting job is mulled in a Speedmullor. Cores blown on the Champion Blomatic Core Blower at left, are rolled over and drawn on the Rol-A-Cor Unit at right. *Champion Cormatic units are described in a new bulletin available from Beardsley & Piper, Div. Pettibone Mulliken Corp., 2424 N. Cicero Avenue, Chicago 39, Illinois.*



(*Continued from page* 215)

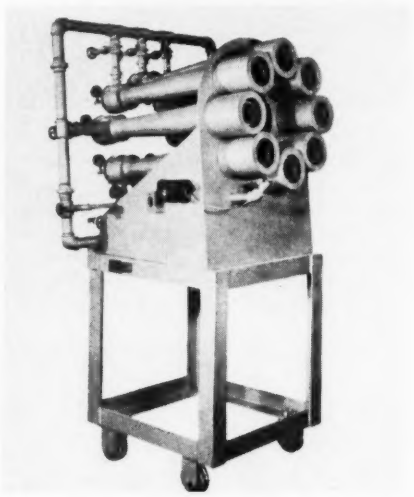
pressure, die casting machines feature a new clamp design and advanced design injection ends. Clamp design limits dimensional elongation or compression to prevent die blow on overload or with off center loads. Injection end is a package power unit, including pump, motor and reservoir. Line consists of cold chamber models from 200 to 1000 tons and gooseneck models from 100 to 600 tons.

For More Details Circle No. 28—Page 209

Drop Hammer: Chambersburg Engineering Co., Chambersburg, Pa. —Air operated piston lift gravity drop hammer is engineered for use on malleable castings that require straightening or coining. Flexible blow control permits any variation of stroke while requiring no time out for friction or stroke adjustments. Dies for straightening or coining may be of cast iron or machined tool steel. Die life depends upon the intricacy of the part.

For More Details Circle No. 29—Page 209

Aggregate Dryer: Eclipse Fuel Engineering Co., 1102 Buchman St., Rockford, Ill.—Portable gas burner assembly for aggregate drying can throw a 30 ft flame. Its eight burners produce 40 million Btu per hr, firing 10 lb natural gas. The assembly of eight 6-in. burner nozzles with atmospheric mixers, push button spark ignited, constant burning pilot and gas manifold is used for dehydrating sand and gravel ingredients of bituminous mix.



For More Details Circle No. 30—Page 209

Fork Lift Trucks: Baker-Raulang Co., Baker Industrial Truck Division, 1230 West 80th St., Cleveland 2, O.—Company has added two gas-powered electric transmission fork lift industrial trucks to its line. One is rated for loads up to 5000 lb, the other for loads up to 6000 lb. Design features incorporated into both models worm-gear-driven power axle, inching control and variable voltage, direct-current generator integral with engine to generate power for series motor mounted on power axle.

For More Details Circle No. 31—Page 209

Metallizing Gun: Metallizing Co. of America, 3520 West Carroll Ave., Chicago 24, Ill.—General purpose metallizing gun weighs 5½ lb and is designed to spray a fine, dense coating using wire from 20 gage to 3/16-in. diam from the highest melting point molybdenum to the lowest melting point wires. Individually driven dual feed rolls reportedly eliminate possibility of wire slippage. Gun will operate on acetylene, pro-

Need core plates that SPEED PRODUCTION?

. . . then use TRANSITE CORE PLATES that are light-weight and easy to handle

You'll find two important reasons why Transite* Core Plates mean faster production: First, core makers can handle more plates with fewer trips. Second, Transite Core Plates are easier to clean . . . core wash, sand, etc., do not adhere to them as readily as to other core plate materials.

Here are more *reasons why you can profit by using Transite Core Plates:*

They give long service—Made of tough, fibrous asbestos and cement, Transite Core Plates resist shock and corrosion—will not crack or break easily—require little, if any servicing. *Performance records of 8, 10 and 12 years are not unusual.*

They maintain accuracy — Transite Core Plates stay smooth through long, hard service. Foundrymen who have used them for years report minimum warpage.

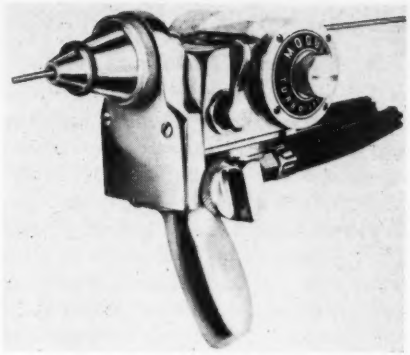
For cores of large mass and small surface area, perforated Transite Core Plates are also available to eliminate green cores and reduce baking time. For full details write Johns-Manville, Box 60, New York 16, N. Y.

JOHNS-MANVILLE JM PRODUCTS

*Reg. U. S. Pat. Off.

Johns-Manville TRANSITE CORE PLATES

Made of Asbestos



pane or natural gas. Magnetic controlled governor gives controlled turbine power using 60 psi air with a wire speed range from 2½ in. to 20 ft per minute.

For More Details Circle No. 32—Page 209

Spectrometers: Baird Associates Inc., 33 University Rd., Cambridge 38, Mass.— Advanced engineering principles reportedly are designed into new models of company's direct reading spectrometers to improve analytical facility in handling a wider range of materials under diverse conditions of sample concentration, range, excitation, elements and matrixes.

For More Details Circle No. 33—Page 209

Stacking Shipping Box: Paltier Corp., 1701 Kentucky St., Michigan City, Ind. — Heavy-duty knock-down steel frame, wire mesh shipping container permits tiering when loaded and folds down to a compact unit when empty. Each folded unit stands 15¾-in. high while a tier of eight

totals 87½-in. high. Units can be tiered when open or knocked down. Clearance of 2 in. between containers permits them to be handled with fork trucks. Each unit has capacity of two tons. Two standard sizes are available: 40 x 48 x 24 in. high and 32 x 40 x 24 in. high.

For More Details Circle No. 34—Page 209

Mobile Crane: Coles Cranes Inc., P.O. Box 942, Joliet, Ill.—Gas-electric powered crane, designed to lift 4 ton at 10 ft radius, features self-resetting limit switches on hoist and boom hoist motion, automatic overload and cut out and reversible steering. Crane measures 7½ ft wide x 11½ ft long and is said to lift its full rated load throughout the full circle of swing.

For More Details Circle No. 35—Page 209

Temperature Indicators: Tempil Corp., 132 West 22nd St., New York 11, N. Y.—Newly developed temperature indicators for 413° and 438° F permit the company to offer a complete set of temperature ratings in 12 or 13 degree intervals from 113 to 450° F, in 25 degree intervals from 450 to 550° F, and in 50 degree intervals from 550 to 2000° F.

For More Details Circle No. 36—Page 209

Chippers' Goggles: Pennsylvania Optical Co., Reading, Pa.— Construction of chippers' goggles provides ventilation directly to the inner lens surfaces through slots in the lens retaining rings and channels in the lens seat area, as well as through channels between the lens retaining rings and cupwalls. This ventilation system is said to eliminate lens fogging. Goggles are available in brown opaque, clear or green transparent thermoplastic cups with standard 50 mm size safety lenses.

For More Details Circle No. 37—Page 209

Meet today's need for...

HIGHER EFFICIENCY

Use PORITE Ceramic Strainer Cores

If you now use sand strainer cores—here is a real opportunity for higher efficiency in your pouring operations! Porcelain Products' ceramic strainer cores are a proven factor in providing cleaner, slag-free castings—reducing foundry rejects—contributing to more efficient foundry operation.

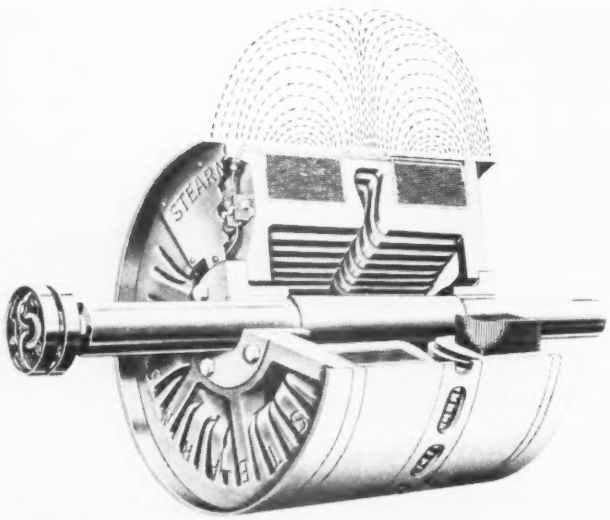
Porite cores permit controlled pouring—will not spall, erode, or disintegrate during pouring—reduce machining time through cleaner castings. Bonded with interlocking refractory crystals, Porite Ceramic strainer cores withstand high heat, thermal shock—can be stored indefinitely.

Write today for sample cores to make your own efficiency test—FREE.

60 years Porcelain Products, Inc. PP INC.

FINDLAY, OHIO

HERE'S REAL MATERIAL HANDLING NEWS



Cutaway showing 2-coil construction. This design provides a deeper magnet field at the center of the pulley — a pattern which conforms to normal load conditions.

New STEARNS 2-coil magnetic pulley removes more tramp iron than larger units on many conveyor operations – yours may be one.

Stearns now offers a powerful new electro-magnetic pulley that provides exceptional tramp iron removal *throughout the entire load mass.* Two-coil design produces a magnetic field that is deepest at the center of the conveyor belt where load is heaviest. The area of magnetic attraction is the same general shape as the load on a conveyor operating under standard conveyor practices.

Pulley costs less

Because of the nature of the magnetic field, smaller pulleys costing less, can now be used on jobs where larger units were formerly needed. An examination of data on a number of proposed installations showed that, in the majority of the cases, the recommended new 2-coil pulley is of smaller diameter than a 3-coil pulley handling the same job.

Get all the facts on this new magnetic pulley. Find out how it simplifies pulley selection. Write for bulletin 303-C.

Diagram showing magnetic field for 2-coil, 36-in. dia., 42-in. wide pulley. Note how magnetic field blankets entire load.

Diagram of same size 3-coil pulley. Note how center of load extends above magnetic field. Conveyor would require a larger pulley operating at slower speed in order to do an effective tramp iron removal job.

SIMPLIFIED PULLEY SELECTION METHOD*

Because this pulley fits right into recommended conveyor standards for speed of belt travel and depth of load for various types of materials, it is far simpler to select the right pulley than ever before. Stearns provides new selection tables in Bulletin 303-C that now make it possible for you to select the right size unit for your job even before you consult our sales engineers.

*Copyrighted 1954 Stearns Magnetic, Inc.

1107

MAGNETIC EQUIPMENT FOR ALL INDUSTRY

STEARNS MAGNETS

STEARNS MAGNETIC, INC. 662 S. 28th St., Milwaukee 46, Wis.

Cleaning Room Bottleneck

(*Continued from page* 99)

of section thickness at 1650°F. Stainless steel and special alloy castings are heat treated in two additional oil-fired ovens, having hearths measuring 3 x 5 and 4 x 5 ft. An electric oven with 2 x 4-ft hearth is used for tempering small castings at temperatures up to 1300°F. Facilities are available for oil or water quenching. After annealing, castings are given a final blast cleaning in either the tumbling machine or the walk-in room.

Inspection procedures involve a visual check for surface defects, dimensional verification with fixtures, and Magnaflux and gamma radiographic observation on a sampling basis. Valves and other pressure-type castings are checked in special fixtures which seal all casting openings except one through which 90 psi air is introduced. Casting exteriors are sprayed with a soap solution; the development of any bubbles by escaping air, of course, indicates leakers. Defective castings are repaired by welding and retested. Satisfactory castings are stamped with a "T." Large castings which do not fit into the testing jigs have lugs welded around openings so that rubber-faced metal covers can be clamped in place for the test. Castings which can not be repair welded for use total 2.6 to 3 per cent of good castings produced.

Use Electric Furnaces

Melting furnaces at Empire are located along one side of the rectangular foundry building between the large casting cleaning section and molding facilities. They consist of a 1½-ton per hr side-charge electric furnace for stainless steel melts and a 2-ton top charge unit for carbon and low-alloy steels. A 600-lb electric furnace is used occasionally as needed to melt metal for specialty work. Charges in the large furnaces are made up of 2900 lb purchased plate scrap and 2600 lb returns. Metal is brought in from the storage yard by wheelbarrow and fork truck and weighed on a floor scale. The side charge furnace is charged by hand and the top charge unit by organge peel bottom bucket. A rope holds the bottom segments in place while the bucket is hoisted by bridge crane and lowered into the furnace. An oxygen lance is used to remove carbon from the melts.

A spiral fluidity test casting is poured in a dry sand mold for every heat. Also a wedge bar is poured

with metal spooned from the furnace and subjected to a chemical analysis and brinell hardness test. Diameter of the indenter impression is related to carbon content of the metal.

Carbon and low-alloy steel heats are tapped at 3000°F and stainless at 3150°F into a 7000-lb lip-pour bull ladle carried by a bridge crane. The metal is deoxidized with 2½-lb of aluminum per ton.

Trunnions at opposite sides of the bull ladle permit it to be placed in a stand and tilted for filling the 500-lb capacity pouring ladles which are carried by a bridge crane monorail system over the small molding area. Large molds, made in the floor molding section spanned by the large bridge crane, are poured directly from the bull ladle.

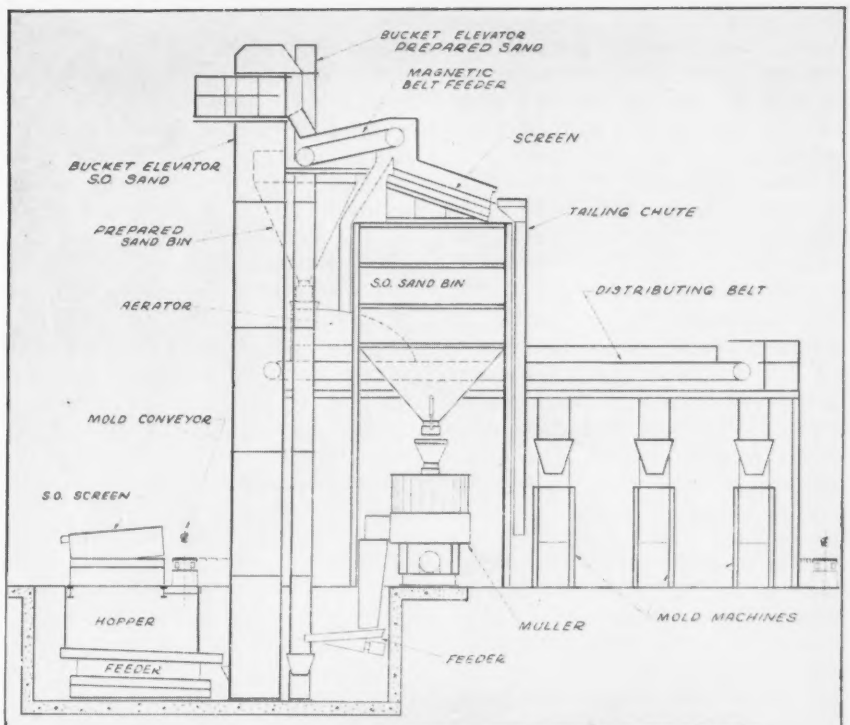
The small molding area is equipped with three squeeze machines, a jolt squeeze arm lift machine which handles split trunnion flasks, a 24 x 30-in. jolt machine and a 24 x 30-in. jolt machine with the table built out to 44 in.

Facing sand used in this section is hand-wheeled to the molders from a chute near the end of an overhead delivery belt. Backing sand is available to each machine from individual overhead hoppers.

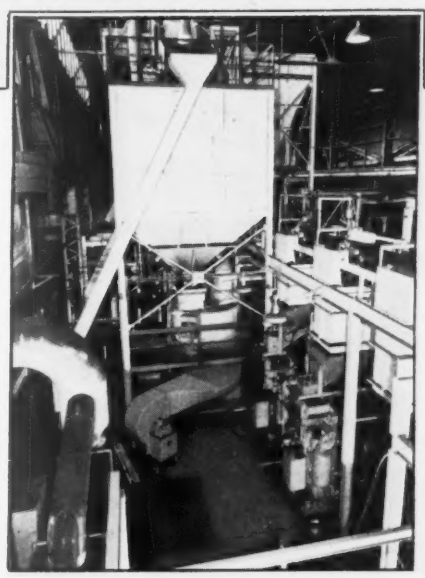
Set Molds on Dollies

As molds are completed they are set off on metal dollies, consisting of two 2 x 2-in. steel channel sections about 6 ft long with 20-in. cross members welded near their ends. Grooved wheels rotate in holders at the four junctions. The dollies are hand-pushed along tracks, comprised of angle rails with the V-edge up, mounted on the floor of the pouring area between molding machines and shakeout. There are six sets of tracks, with gravity roller conveyors between the sets for returning dollies and wooden bottom boards to the molding machines.

Immediately in front of the squeeze and jolt-squeeze machines are pneumatic mold set-off devices, each of which raises a dolly to waist height. Molders need only to remove a mold from the machine, turn around and deposit it on the elevated dolly. When a dolly is filled, it is lowered to track level and pushed off by a molder's helper to the pouring zone. The helper then takes an empty dolly from the three gravity conveyors, places it on the track over the set-off device and depresses a foot valve to raise it to position. Molds are removed from the jolt machines to dollies by hand or with a jib crane.



Complete PLANET engineered system at AMICO



At Albion Malleable Iron....

Peak Production in 66'x26'

(FLOOR SPACE)

This PLANET system at AMICO furnishes up to 58 T.P.H. of prepared sand, permits excellent quality control, and provides lower handling costs.

PLANET manufactured components include a 150-ton sand bin, sand preparation system, sand distributing conveyor, hoppers, mold conveyor, overhead pouring rails, shake-out and return sand system.

It's good business to follow AMICO'S example and "Plan with Planet", because a *mechanized* foundry is a more *profitable* foundry. WRITE OR PHONE TODAY . . . for information on mechanizing your operation.

PLANET CORPORATION

1818 SUNSET AVENUE
LANSING, MICHIGAN

- CONVEYORS
- ENGINEERED SYSTEMS
- FOUNDRY EQUIPMENT
- AUTOMATION
- STEEL FABRICATION

An inspector spot checks the molds as they are made with a mold hardness tester and examines all molds on the pouring floor for shift and dirt. Baked sand pouring cups, weights and jackets are placed on all molds before they are poured. A timekeeper counts the molds after they have been poured. His count is checked with that which the molder turns in at the end of the day.

Poured molds are pushed to a portable vibrating shakeout. This is a 4 x 6-ft unit equipped with electrically driven wheels and rides on a track over a floor grid at the ends of the pouring section rails. The shakeout is hooded, and the hood opening aligns with openings in a dust collector pipe overhead when the shakeout is moved to handle molds at the ends of the six pouring tracks. Loaded dollies are lifted to a near vertical position by a pneumatic device. The latter has two arms which rest between and below the level of the pouring section tracks. Sand and metal fall to the shakeout, but the bottom boards are kept from sliding off the dollies by a raised edge at the back of the lifting device. Empty dollies are lowered to the track for removal by hand to the return roller conveyors.

Sand Taken to Storage

Castings are hooked off the shakeout into dump boxes for transport to the cleaning department. Sand falls through to a 24-in. asbestos conveyor belt and is carried over a magnetic pulley onto a second belt which feeds a bucket elevator. The elevator discharges into a horizontal, tubular, rotating screen. Screened sand falls through a chute into a 250-ton capacity silo, and lumps roll out the end of the screen down a chute into a tote box. Tramp iron removed by the magnetic pulley also falls to a tote box. Both containers are removed periodically by lift truck for emptying.

The shakeout sand conveyor also picks up sand from the permanent shakeout in the large casting section as well as new sand delivered to the foundry. New sand arrives in box cars and is shoveled to a portable electric conveyor which feeds the shakeout conveyor. Shakeouts are not operated during the time new sand is being fed to the belt. New sand is diverted from the rotary screen by a switch in the entering chute which dumps the sand to a 20-in. rubber belt conveyor passing over three additional 400-ton capacity silos. It is plowed off to either of two silos. The third silo, for core sand, is supplied in the same manner.

Two mullers—1000 and 1100 lb capacity—are located beneath the molding sand silos inside the building at one end of an 8 x 100-ft mezzanine. Bags of sand additives are brought into the building and placed on the mezzanine by a high-lift gasoline fork truck and moved to mullers by two-wheeled hand truck as needed.

Above and between the two mullers is a weigh hopper which discharges to either muller through a split chute equipped with a hand-operated jaw gate. Used sand falls directly from the silo through a pneumatic-cylinder-operated gate to the weigh hopper. New sand falls by gravity through chutes from both silos to a mixing bin, and from there it is fed by vibrating feeder to a 24-in. inclined conveyor belt to the weigh hopper.

Dry additives are added to the mix by weight, and water is metered. The standard sand mixture is: Facing sand—550 lb new AFS 50 sand, 550 lb used sand, 35 lb western bentonite, 14 lb fire clay, 10 lb silica flour, 8 lb cereal flour and 3.0 to 3.5 per cent moisture. Backing sand—1100 lb used sand, 1 lb western bentonite and 3.0 to 3.5 per cent moisture. Both formulations are mixed dry for 1 minute plus 4 minutes after liquid additions. Other mixes are used to meet the requirements of special work. Sand tests for moisture, permeability, deformation and green strength are performed in the mulling area on each batch.

STILL NEEDED: A village "smithy" still plays an important role in the maintenance of machinery, tools, and other equipment at the mammoth Ford Motor Co.'s Cleveland Foundry. Plying his trade since 1921, Sidney Christmas does work vital to modern-day production which still cannot be performed by today's miracle machinery

Prepared sand is discharged from the mullers to a 24-in. inclined belt which feeds an aerator. A second 24-in. belt takes sand from the aerator and carries to over molders' hoppers where a man on a catwalk operates V-plows to keep hoppers filled. The delivery belt terminates at a large hopper in the floor molding section.

The floor work area, 40 x 160 ft in size, is adjacent to the small molding area and on the same side of the building as the large casting cleaning section. Sand is fed to the area by the overhead belt conveyor which terminates at a common hopper equipped with three bottom-gated chutes. A 28 x 40-in. jolt machine is located under each of two chutes. Sand is discharged from the third chute to a wheelbarrow or bridge-crane-handled bucket for use in hand-rammed molding on the floor or on a bench provided for specialty items.

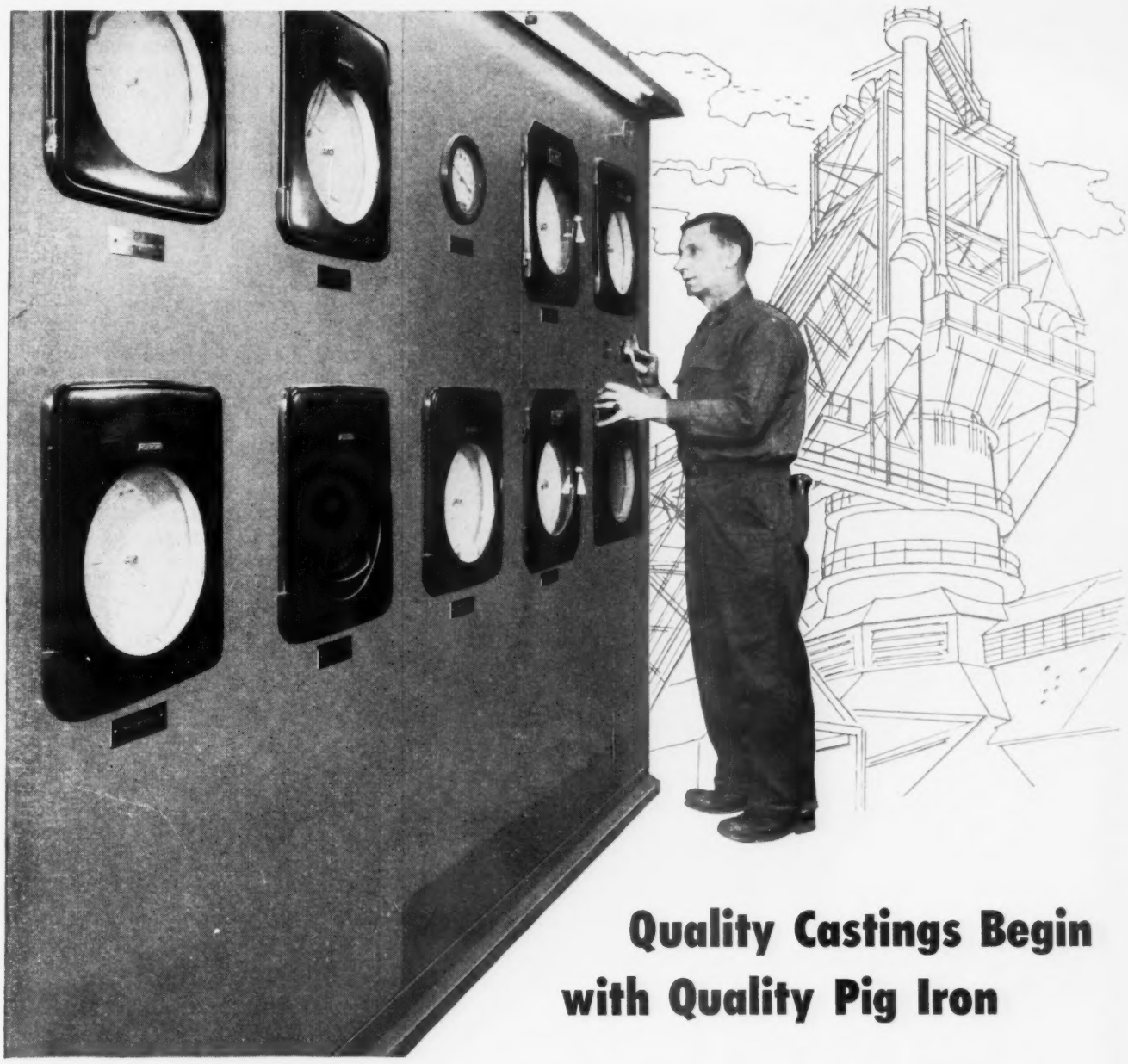
Molds Shifted by Crane

A jib crane is used to set molds from the jolt machines to a roller conveyor for pouring. The 7-ton bridge crane used for handling the pouring ladle also transports poured molds to a vibrating shakeout.

The coreroom is located at one end of the building behind the molding areas. It is equipped with a core blower, two benches for making heavy cores, seven benches for small and medium core work and one oil-fired batch oven. Green cores are loaded on asbestos cement boards and placed on metal shelf racks spotted around the area with a hydraulic lift platform hand truck. This truck also moves the racks in and out of the ovens. Contour aluminum driers are used only on those comparatively few jobs requiring them. Cores are baked at 410°F on a 2-hr cycle.

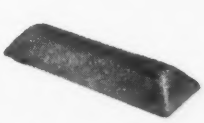
Core sand is prepared in a 200-lb batch muller located near the molding sand mullers. Sand is dropped through a gate at the bottom of the storage silo to a weigh hopper with a bottom gate discharging into the muller. Water and core oil are measured by volume, dry additives being measured by weight. Moisture content and green strength are determined at the sand testing center in the mulling area. Several mixes are employed for the various jobs, but the one most used—classified as the regular mix—consists of 200 lb AFS 72 sharp sand, 3½ lb cereal flour, 1 qt core oil, 1 qt core oil ex-

(*Concluded on page* 224)



Quality Castings Begin with Quality Pig Iron

THE quality of your gray iron castings depends on pig iron produced under controlled conditions. That's why we take special care in the production of Neville Pig Iron, day in and day out, year in and year out. Modern controls like those above, for example, enable us to maintain furnace temperatures and pressures within a cat's whisker of perfection. When you specify Neville Pig Iron, you're sure of uniform, close grain and the precise analysis you need. ● Why not let Neville Quality work on *your* side, just as dozens of well-known foundries do. We'll be glad to discuss your specific problems and requirements.



Neville **Pig Iron and Neville Coke for the Foundry Trade**

PIG IRON DIVISION

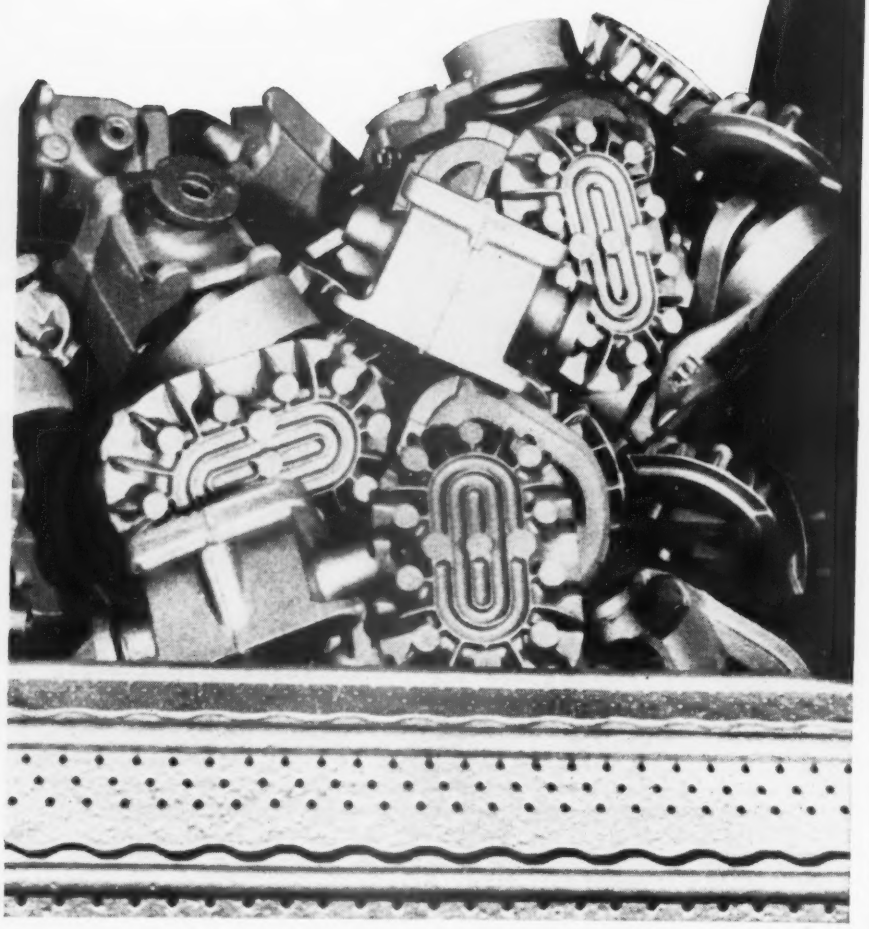
PITTSBURGH COKE & CHEMICAL CO.

Grant Building • Pittsburgh 19, Pa.

W&D 5242

COAL CHEMICALS • AGRICULTURAL CHEMICALS • FINE CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

These castings were cleaned by "CERTIFIED" ABRASIVES!



"Certified" does a better job in less time at lower cost.

Why? Because "Certified" Samson Shot and Angular Grit is made *extra-tough. Extra-tough* to clean more thoroughly, more quickly. *Extra-tough* to last . . . to be reused again and again without breaking down.

It all adds up to lower time, labor, and abrasive costs for you. See for yourself! Switch to the abrasive made by the oldest abrasive manufacturing company in the world . . . switch to "Certified" Abrasives!

THE STANDARD OF EXCELLENCE FOR OVER 60 YEARS

PITTSBURGH CRUSHED STEEL CO., Pittsburgh, Pa.
STEEL SHOT AND GRIT CO., Boston, Mass.
MEMBER FEMA

(*Concluded from page* 222)

tender and 4.0 to 4.5 per cent moisture. Ingredients are mulled dry for 2 minutes and 8 minutes after liquid additions. Sand is delivered to coremakers in tote boxes by the hydraulic platform lift hand truck and shoveled to the blower hopper and benches.

Although no patterns are made at Empire, a shop is set up in a separate building for pattern repairing and the making of wooden gating systems. Before patterns are delivered to the foundry they are tagged with a ticket showing customer name and order number, Empire's order number, number of castings to be made, number of castings in each mold, casting weight, flask size, shipping date and the price paid the molder for each mold.

A third building houses laboratory equipment for physical and chemical testing and a dark room. A sample of metal from every heat poured and all purchased scrap is chemically analyzed. Periodic tensile tests are run on keel block bars poured from various heats. In addition, a screen analysis is run on all incoming sand before it is unloaded.

Dry dust collectors handle air contaminants from each centrifugal blast machine, each shakeout and the shot blast room. Dust is collected in elevated, bottom-gated hoppers outside the building and periodically hauled to the dump in trucks.

Booklet Lists Rules for Effective Orders

Concrete suggestions to supervisors who delegate orders to plant or factory employees are given in a new booklet issued by the National Foremen's Institute. The booklet, "You Can Give Orders That Get Action!" gives simple rules and helpful items in telling its story. Copies of the booklet are 25 cents each and can be ordered from the National Foremen's Institute, New London, Conn.

Survey Pension Plans

Pension plan data are given in the report of a survey made by the National Foundry Association, 53 West Jackson Blvd., Chicago 4. The features, applications and costs of pension plans as they are in effect in the 94 foundries which responded to the questionnaire are tabulated. The results of the survey are published in a booklet titled "NFA Survey of Pension Plans in the Foundry Industry."

Diecasting Defects

(*Continued from page* 85)

Remedy: Stop the machine, open dies and thoroughly clean the parting surfaces, looking for burrs, lodged substances, misplaced cores, dowels or other objects likely to prevent proper closure.

Next, slowly advance moveable platen and die block to closed position until parting surfaces are very lightly in contact. Test degree of contact at all points around parting-joint by feeler gage. If the gage enters at one side of die, the machine clamping toggle-lever or pressure-rod should be adjusted until complete sealing is obtained.

If this step produces no material reduction of flash, other causes must be investigated. The machine might be shut down, both die blocks removed from platens, and their faces examined for cleanliness. Lodged particles of alloy, burrs, etc., must be removed.

Check Parallelism

Both die blocks should be checked separately for parallelism at all points across the parting-line. Burrs and adhesion should be removed from rear face of each block before it is replaced on the machine.

Cause 3: Lodged particles on die parting joint. Excessive flash at parting line may be due to improper closure of die blocks because of objects between parting surfaces. For example, excess metal particles may build up in crevices, or oil or die dressing residues may accumulate and be compressed into hard adhesions. Frequently they occur at the roots of dowels or in the bottoms of blind guide holes for dowels, etc.

Effects: Flash usually is of very unequal thickness, concentrated at one or two points, rather than distributed over all sides of the part. The thickest portion of flash coincides with the point of insufficient closure on all castings. The extent of such localized, thick flash may vary, however, with short runs relatively free from flash. This result occurs because pressure of the closing dies can be sufficient to disintegrate the hard accretions on parting surfaces after a certain amount of compression.

Remedy: Unfortunately, it is not always easy to locate such accretions when the die is hot and mounted on the machine platens. If necessary, the die should be removed for thorough examination.

When the accretions have been located, reasons for their build-up

(*Continued on page* 228)

EQUIPMENT and SOURCES
for GAMMA RADIOGRAPHY

FOR YOUR NON-DESTRUCTIVE TESTING

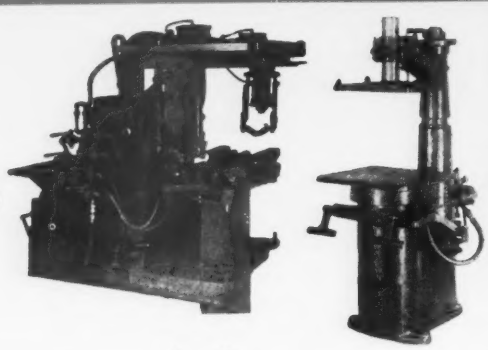
RADIATION SOURCES

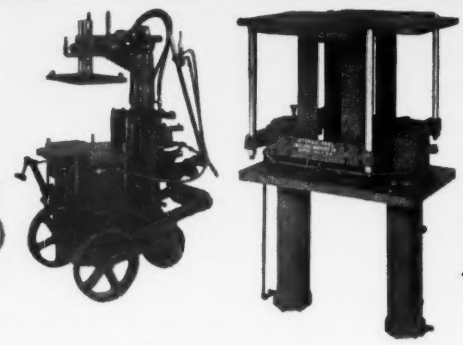
HANDLING EQUIPMENT

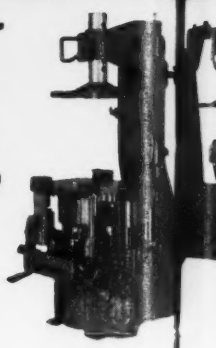
STORAGE CONTAINERS

RADIOGRAPHY ACCESSORIES

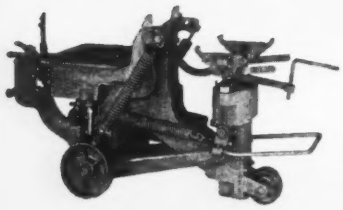
TECHNICAL OPERATIONS INC.
6 SCHOULER COURT · ARLINGTON, MASSACHUSETTS

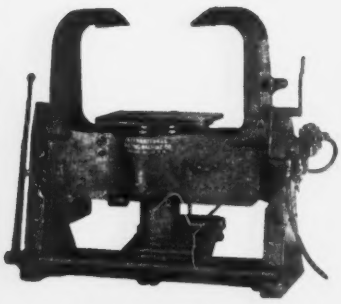


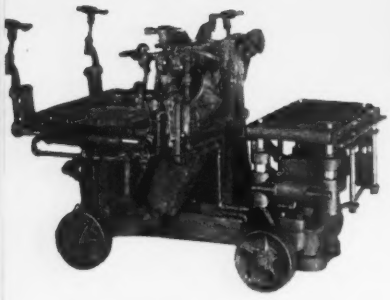




Merry Christmas

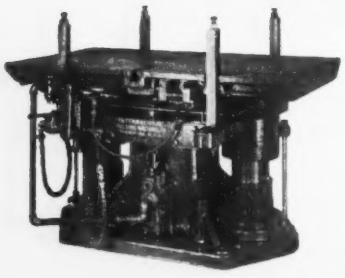


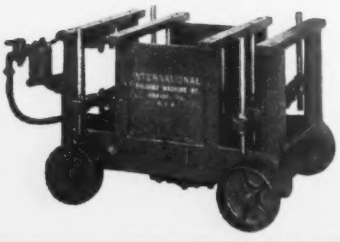


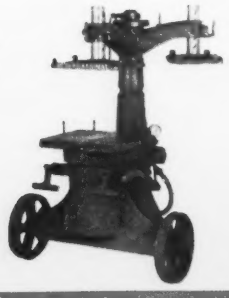


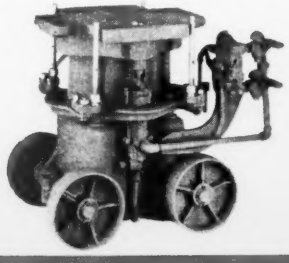
INTERNATIONAL MOLDING MACHINES

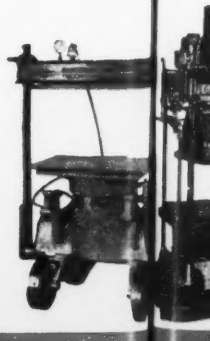
are busy in foundries all over the United States, performing their vital part in the nation's industry. Where High Production is important, Foundrymen specify . . . . . INTERNATIONALS

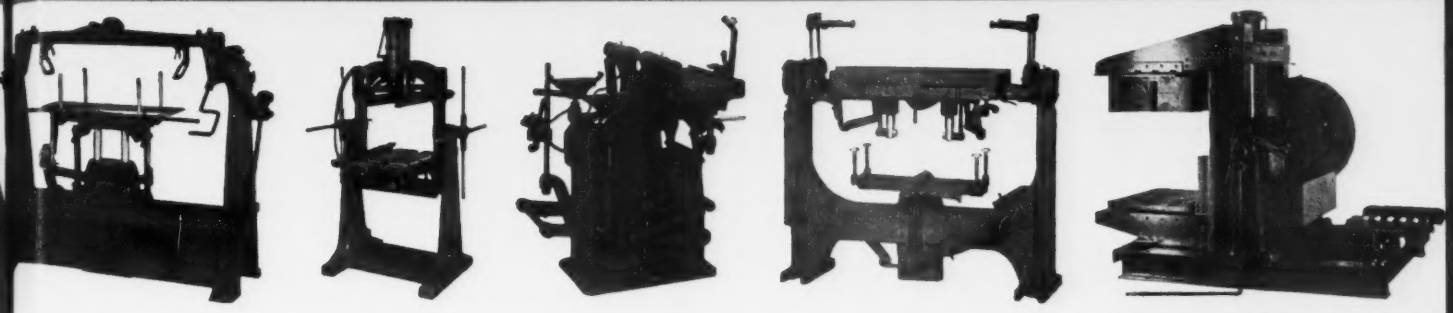




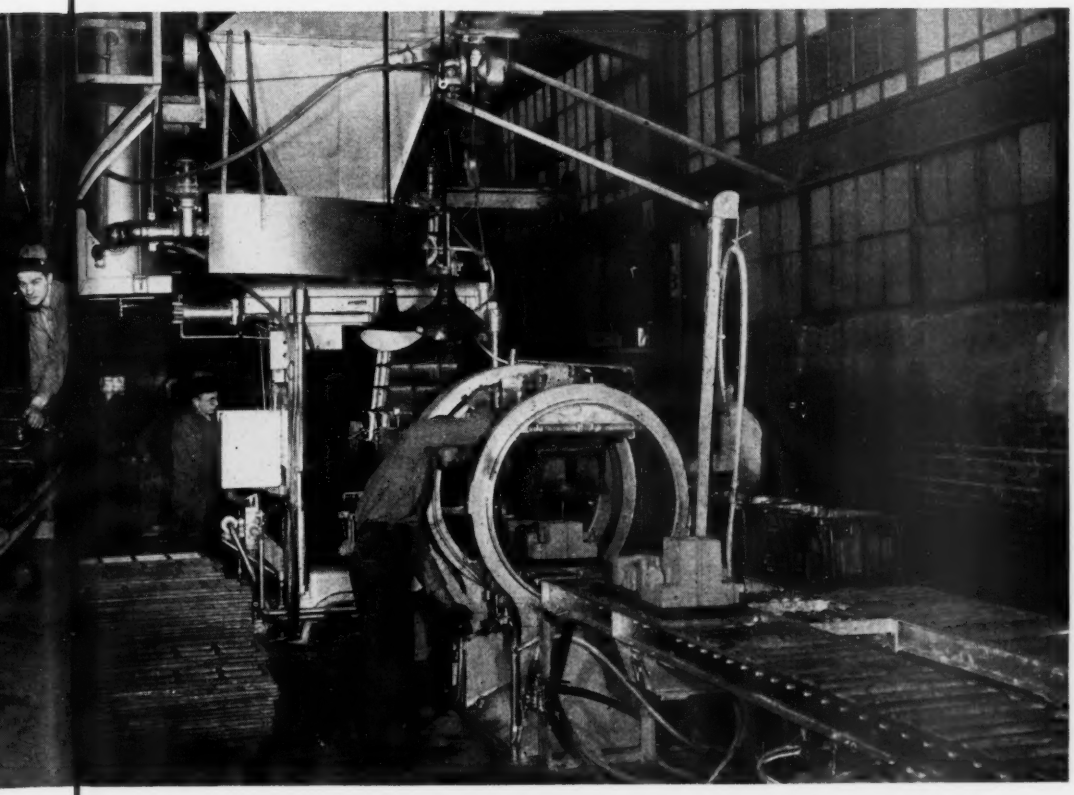


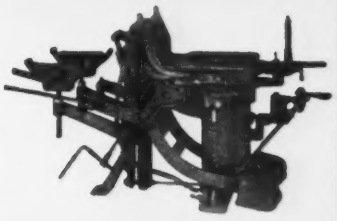


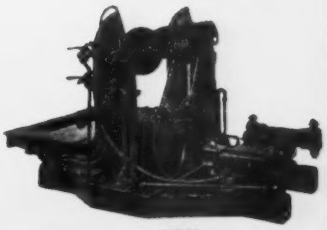


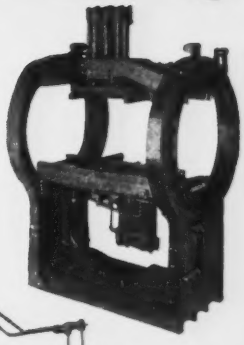


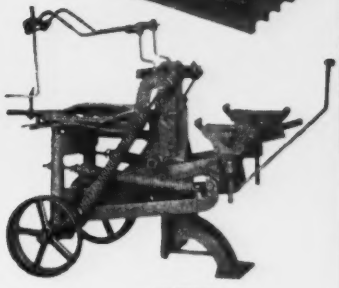
Happy New Year



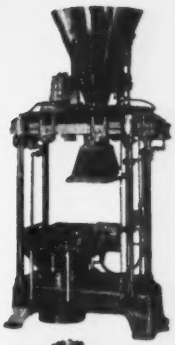


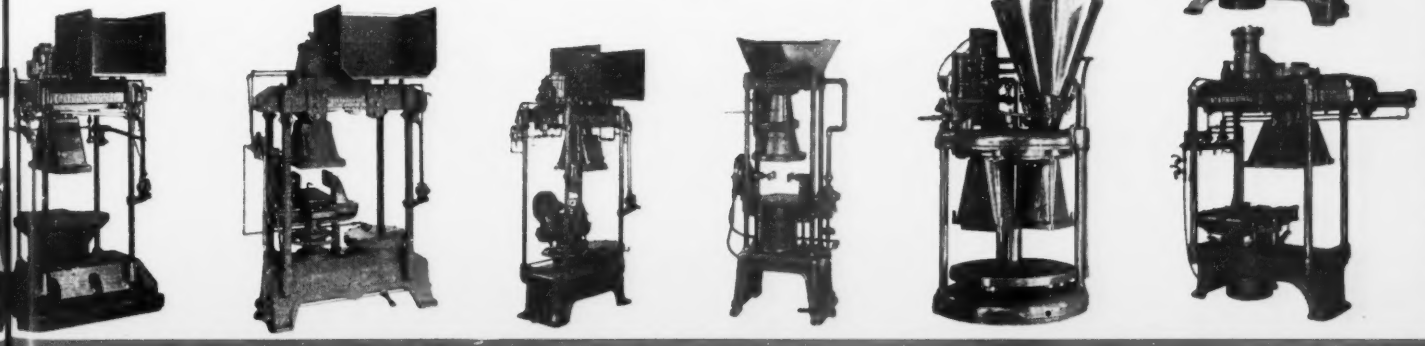






INTERNATIONAL
MOLDING MACHINE CO.
LA GRANGE PARK, ILLINOIS





(*Continued from page* 225)

should be sought. For example, lubricants may be overflowing from a core bearing, core-slide guideway or other die mechanism. Careful checks should be made to determine the possibilities of eliminating such lubrication requirements or of fitting effective seals.

Cause 4: Distortion of die blocks on their parting surfaces. Occasionally die blocks cannot be sealed properly at all points because of distortions of one or both blocks.

Effects: This condition usually results in grossly unequal flash thickness around the casting in substantially the same position on all castings. Moveover, flash tends to worsen over a long production run, especially with the higher melting point alloys or where control over operating conditions is poor.

Die block distortion may arise from: 1. Excessive and prolonged overheating of the die; 2. Excessive or unequalized locking pressure, resulting in over stressing of weak or unsupported portions of the die; 3. Poor design and construction, entailing unequal distribution of metal mass in blocks, particularly surrounding cavity formations, core-slide guideways and other large openings; 4. Persistent improper mounting on machine platens—that is, when faces of platens or die are dirty, bruised or misaligned by faulty machining in first place; 5. Gross mishandling of die during setting-up, maintenance or storage; 6. Fatigue of metal after long exposure to severe working conditions.

Remedy: Inaccurate parting surfaces of die blocks require light regrinding or lapping on high spots until the required width of land seal is obtained around critical cavity and runner channel edges.

To prevent a recurrence of this trouble, all possible causes should be investigated before the corrected die is remounted.

It sometimes helps to "relieve" the parting joint surface of one die block about 0.005-in. to about ¾-in. from the edge of the cavity at all points around that formation. This provides a sealing land of much smaller area

(*Continued on page* 230)

Things to Watch in
BUYING FOUNDRY EQUIPMENT

By ERNEST W. FAIR

I SURE wish that I hadn't bought that piece of equipment. It's been wrong from the start and has cost us plenty of profits. But we can't discard it because of the investment we have in it; we're just going to have to live with it and take our loss."

How many times has this statement been made by manufacturers? Many times, we are sure.

To avoid such situations we have asked a number of experts for suggestions. Here are the points they suggest checking:

Accurate Specification should be a must. The job to be done should decide what unit we will buy rather than purchasing a desirable piece of equipment and then fitting it into the plant.

Best Value is important in the choice of any piece of equipment. Comparison should be made on a basis of value in durability, economy of operation, workmanship, materials, etc. Price alone does not determine such "best value."

Performance needs close checking. Such performance checks should consider the figures in the light of production set up at a particular plant. We should not assume that ours will have the same. Probable performance in our own plant rather than some other or under testing conditions is the factor which should receive our attention.

Maintenance Cost is becoming more and more important. Plant operating margins are being squeezed tighter and tighter by high wages, taxes, etc., and we are forced to seek lower plant operating costs to compensate for them. One possible source is always on maintenance of equipment.

For that reason it is most important to consider any unit's ability to give us uninterrupted production at a very minimum of operation and maintenance cost in making a selection.

Future Needs should always receive consideration. Selection on a basis of current needs only is not always wise. Six months or a year later the unit chosen may no longer fill its role. As business increases so does our rate of production. It is always good policy to select new units on higher rated capacity basis than may be needed at the present time. If the unit cannot handle future needs normally, we will push it beyond safe operating limits to keep up with the extra load. That means excessive maintenance cost, reduction in the useful life of the unit, and possible breakdowns.

Flexibility is always desirable in any piece of equipment. A unit bound to fixed work output can never be used in peak production. It also boosts operating costs during slack periods. Wherever possible it is most advisable to select a unit incorporating the maximum amount of flexibility.

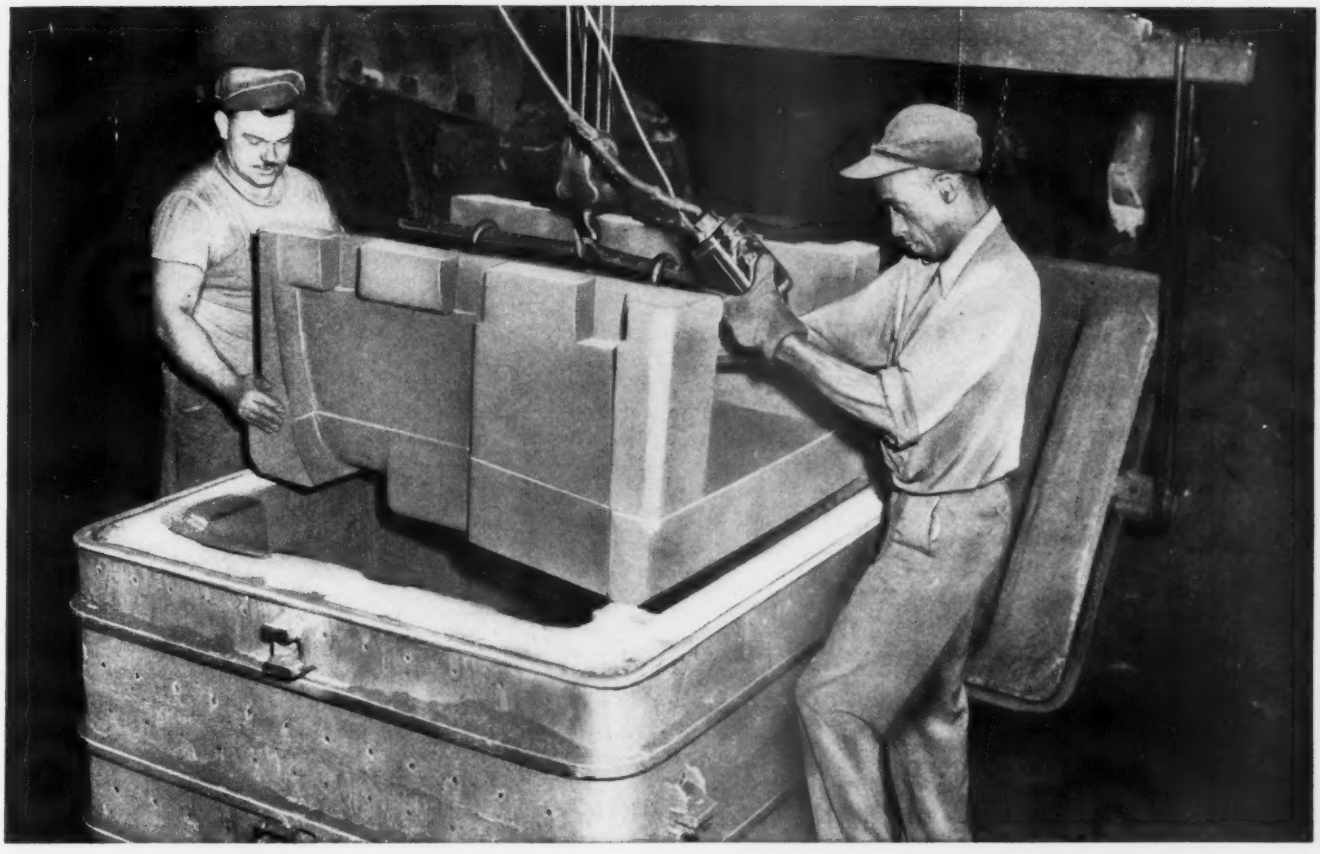
False Economy in determining which unit we shall buy is one of the greatest dangers in equipment buying. First cost should never be the determining factor. A unit may have excessively high operating costs, possess a reputation for costly maintenance or otherwise be so expensive in use that any saving made on the initial purchase soon vanishes.

The price factor should be determined on a basis of the list figure, but after close study of possible operating and maintenance costs combined with the initial price. It is good procedure to draw up an estimate of such maintenance and operating costs over a ten-year period, for example, on each unit under consideration and add these to the initial price to determine actual cost of the equipment involved.

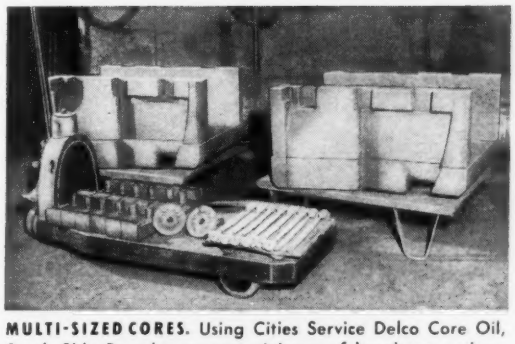
Watch the Extras, for on some types of equipment they can give a false impression of actual cost. Even such things as freight and installation costs should receive consideration when balancing one piece of equipment against another.

Best policy is to prepare a set of figures covering the unit, not at factory f.o.b. price, but what the cost will be when it has been set up and is in actual use in our plant. That is the real cost figure.

We can never exercise too much caution in selection of our plant equipment, for once the selection has been made we cannot back track. As the man says, "You're stuck with it then," so the time to avoid such a situation is while we are making the initial choice.



"NOT A LARGE CORE LOST IN 5½ YEARS USING CITIES SERVICE CORE OIL!"



MULTI-SIZED CORES. Using Cities Service Delco Core Oil, South Side Foundry reports minimum of breakage and reduction of overbake in even smallest cores, despite frequent necessity to bake these with the largest.

USING THE FINISHED PRODUCT. Among the many industries using South Side's products is the Hyster Company, whose famous Hyster Kary Krane is equipped with a two-ton counterweight cast at South Side Foundry.

A REPORT FROM JOHN M. McCARTHY, JR., MANAGER OF SOUTH SIDE FOUNDRY, INC., PEORIA, ILLINOIS:

"We have used Cities Service Delco Core Oil for over ten years. After numerous tests we selected this oil for use throughout our jobbing foundry because of its uniform strength under a variety of baking conditions, plus the fact that gas is greatly reduced using this oil.

"Our cores range in size from a fraction of a pound to over 700 pounds each. By the use of Delco Core Oil we are able to reduce overbake of even our smallest cores, although it is often necessary to bake these cores and our large, 700 pound cores at the same time. Breakage of our large cores is reduced to a minimum. In the last five and one-half years, we have not lost one of our large cores. Moreover, our stock cores do not show any moisture pickup when stored.

"We find that Delco Core Oil is economical to use because of its uniformity, its high strength, and its universal adaptability."

This report is typical of the results achieved in hundreds of similar operations throughout the country with Cities Service oils. If you're not completely satisfied with your present core oil, consult your nearest Cities Service representative or write Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

(*Continued from page* 228)

upon which a more effective seal may be obtained. This is particularly advantageous in large die blocks containing very small cavity areas.

Cause 5: Faulty die closure due to defective or improper doweling. A frequent cause of parting-line flash because of die misalignment is defective dowels. They may become bent, distorted, misaligned or loosened in their fixings.

Effects: Castings produced from such dies normally have thick flash at only one side—that contiguous to the defective dowel or dowels. Thickness and extent of such flash may vary within certain limits.

Remedy: The correction is apparent if the affected dowel can be located. Detection is not always possible while the die is hot and mounted in place on the machine. Operation of the die never should be continued when this condition has been diagnosed, for it may be damaged seriously.

Replace bent or distorted dowels, rather than attempt to straighten them. Worn dowels present a more difficult problem, for invariably the guide hole in the mating block has suffered some wear. This requires fitting a larger diameter dowel or bushing out the worn guide hole to receive a standard-sized part.

When such corrections are made, the cause of the damage should be located if possible. It may be caused by a dowel of insufficient size, by poor design or by a faulty mounting.

Poor dowel design often causes die block misalignment. Dies having curved, stepped, inclined or irregular parting surfaces may impose considerable lateral pressures on dowels during closure. If such members are weak, badly guided, or poorly retained, bending or loosening occurs, with consequent additional flash.

Dowels should be of large diameter, with heads disposed in the die block so that they bear the maximum thrust or pull when die blocks are closed or opened. Dowel location also is important; for balanced guidance, dowels should be at approximately equal distances from adjacent cavity walls.

Cause 6: Defective sealing of die blocks because of distributed setting of other die elements. Occasionally some other die member prevents die blocks from giving the close seal necessary to avoid flash.

Effects: Flash may be very thick, occuring at the same place on all castings, and some alloy leakage may occur at each injection shot. Usually the condition is accompanied by stiffened working of die mechanism members because of entry of molten alloy into joints, bearing holes, intersections, etc.

Remedy: Check each portion of the mechanism. Remember, however, that several elements may have become slightly disturbed or have suffered damage; thus each may contribute to flash formation.

Thick Collar Flash — The second flash irregularity in die castings occurs at other points of interruption of the cavity. Generally it arises when movable cores, retracting core-slides, an ejector-rod or sleeves, or rail return-pins are employed and interject into the cavity area, runner channels or the parting-line surface, close to edges of the cavity.

Causes: There are several: 1. Faulty initial setting of rods in relation to cavity wall; 2. Wear of rod guide-holes at point of entry into cavity formation or erosion of critical contact end of rods; 3. Loosening of rod fixings in ejector rail; 4. Misaligned setting or badly guided or awry movements of ejector rail to which rods are attached.

Effects: With most dies, heavy stresses are imposed on rods. Since these usually are of small diameter and considerable length, their setting easily may become disturbed or the rod damaged or worn because of heavy pressures imposed when the casting is ejected from fixed cores.

If the ejector rods are set incorrectly in axial relationship to the cavity wall, flash in the form of raised, solid, circular bosses or circular recesses may be formed. The former occurs if rods are short of the critical cavity wall; the recesses arise if rods project beyond the cavity wall.

Where rods lie below the cavity wall, the casting frequently sticks to the cavity because of the bosses cast into the mouths of rod guide-holes. Where rods are too far advanced into the cavity to form recesses on the casting face, stiffened working of the whole ejector gear results especially at the start of forward rail-movements.

Flash resulting from wear of the rod or its bearing holes is in the form of raised collars or rings. Situated perpendicularly on the face of the casting, it may be very irregular in thickness and extent. The condition is substantially the same on every casting and worsens as production proceeds. In addition, sizable particles of solidified alloy severed from collar flash accumulate and bind in worn portions of hole, causing stiffened working or complete seizure of rods.

If flash troubles are caused by loosened rods, the extent and form of flash vary considerably. Some castings may be formed with thick collar flash, others with raised, solid bosses and yet others with hollow recesses of the same diameter as the affected rods.

If the ejector-rail is mounted improperly, location and form of flash may vary. Thus at certain portions of the casting, rods form recesses because they project too far into the cavity area, but at other points solid bosses are cast because rods do not match exactly with the cavity wall.

Usually the ejector rail works very stiffly, and signs of severe binding

(*Continued on page* 232)

SAND SCHOOL: One hundred and twenty-one men from nineteen states and Canada, shown above, were in attendance at the fifth annual Dietert-Detroit Sand School, Aug. 9-11, held at the Engineering Society of Detroit, under the direction of Frank S. Brewster, general manager, Harry W. Dietert Co., Detroit. Theme of the course was the application of practical sand control to foundry operations

Need Fast Power at Low Cost?

Let

SCHRADER Air Cylinders

do the Work

Schrader Air Cylinders pack a power punch that can't be beat. Ideally suited to pushing . . . pulling . . . lifting . . . lowering — wherever straight-line repetitive operations are required — Schrader Cylinders are used in innumerable applications in industries of all types.

Schrader has a *complete line* of cylinders that will meet any requirement. They are available in single or double acting in any type of mounting and in any stroke.

Schrader Cylinders will produce a power stroke that cannot be equalled manually. And — don't forget — the complete Schrader Line includes operating and control valves of every type, as well as all other compressed air accessories, from air line to air tool. Write today for full details. The coupon below is for your convenience.

Schrader

REG. U. S. PAT. OFF.

Leaders in air control since 1844

A. Schrader's Son
Division of Scovill Manufacturing Company, Incorporated
465 Vanderbilt Avenue, Brooklyn 38, N. Y., Dept. M-3

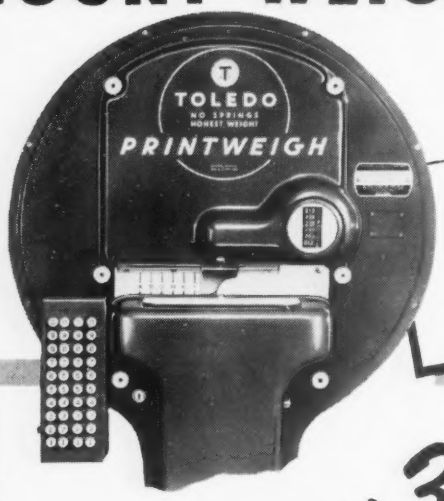
I am interested in more information on _____

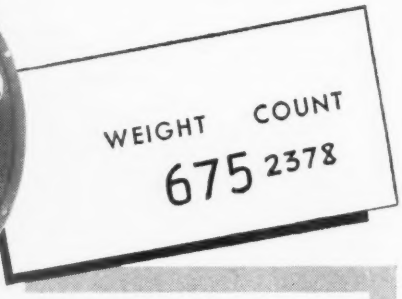
Name _____ Title _____

Company _____

Address _____

New Toledo Printweigh COUNT-WEIGHT system

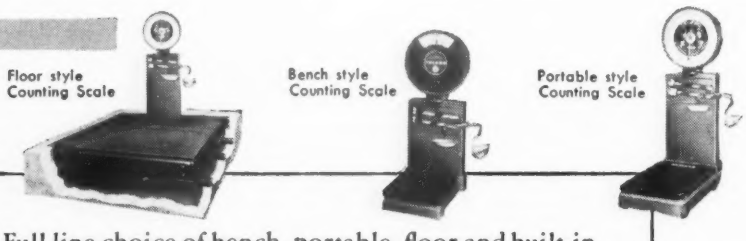




Gives you 3 BIG cost-saving advantages!

Now . . . a scale that counts hundreds of parts accurately in a few seconds . . . and prints both the weight and the count! These new Toledo Printweigh Counting Scales have selective numbering equipment which permits the printing simultaneously of any count up to 9,999 along with the weight figure.

1. **SAVES TIME**—on a Toledo you can count hundreds of parts in a few seconds.
2. **PRINTS THE COUNT**—record the count on the fast-action keyboard.
3. **PRINTS THE WEIGHT**—Printweigh is electrically operated—prints weight and count simultaneously at the touch of the control button.



Full line choice of bench, portable, floor and built-in models for issuing predetermined quantities . . . counting unknown quantities . . . for faster inventory counts . . . or to get accurate receiving, shipping and piece-work counts. Write for new Toledo Counting Scale Catalog. Toledo Scale Company, Toledo 1, Ohio.

TOLEDO®

HEADQUARTERS FOR SCALES

(*Continued from page* 230)

occur on some or all rods. Frequent seizure or breakage of rods also may occur.

Remedy: Although diagnosis of such troubles may be comparatively easy, correction often is difficult. Rods often may be reset without removing the die from the machine. When rods frequently become loose in their fixings on the rail, a thorough examination should be made. Conventional methods of fixing by screwing the rod into the rail and holding it by nuts or by straight riveting, etc., often prove inadequate when a casting has to be pressed off large stationary cores. Threads on rod or nuts become stripped because of heavy axial pressures on the rod at the instant of ejection. To overcome such troubles, employ rods with a substantial shoulder at the end fitting into rail.

Wear Causes Trouble

Greater difficulties may arise if the trouble is a result of wear on rods or guide-holes. If it is feasible, the latter should be enlarged to remove offending worn portions, and a larger size rod fitted. When this is impracticable, it may be necessary to enlarge the hole and fit a bushing to restore it to original size. This involves a careful blending of bush end with cavity wall to avoid producing additional ring markings on castings. Hardened bushings always should be employed.

If there is extensive and persistent erosion of contact ends of rods, selection of a tougher steel for the new members often is the most satisfactory solution.

Where trouble is due to defects in the ejector-rail or its mountings or to misaligned setting, the die should be removed for examination and correction. The ejector-rail may be guided inadequately on pillars or the pillars may have become bent, damaged or distorted by heat or loosened in their fixings. Another frequent cause of rail misalignment and faulty operation is improper location of the rail in relation to the operating ram. The latter should contact the rail substantially centrally with the main rod layout positions. If it bears upon the rail at a point well removed from most rod positions or from the largest members with the heaviest ejection duty to perform, serious misalignment of the rail or seizure or fracture of rods almost always will ensue.

All these undesirable features should be checked and corrected in turn. It often helps to enlarge guide holes in the movable die block for a

certain depth from the rear, to reduce sliding friction between block and rods.

If the ejector rail is fitted with a large number of rods, the preferred form of mounting is to locate each rod in a slight clearance-sized hole in the rail, rather than to screw it into a threaded hole. Lock-nuts on each side of the rail will retain the rod. Nuts should be of ample thickness to engage enough thread to resist axial pressures. By this means a certain small amount of lateral adjustments will be afforded each rod and insure most accurate alignments.

Check effectiveness of the rail guides by a series of stationary pillars fastened into the rear of the die block. Test the security of such pillar fixings. If the rail is of narrow width, too short a guiding and bearing surface may be presented to pillars. When this problem occurs, increasing bearing surfaces by provision of hardened-headed bushings in the rail should be considered.

For best guidance and working ejector gear, pillars should be located at extremities of the member, well outside the ejector rod positions. Four pillars with square or rectangular rails and three with circular rails are best. In cases of persistent rail misalignment and other troubles, careful attention should be given to mountings.

In all cases of ejector-rod and rail troubles, initial design and later corrective treatments should be directed to insure complete guidance of the rail in all its movements by the fixed pillars at the rear. The rods should not have to guide or support the rail.

Flow Marks—Fig. 2 shows a typical aluminum pressure die casting suffering from unsightly flow marks.

This casting, with a large diameter, numerous cored holes and recessed portions, was produced from a single-impression die. The cavity was fed from a gate on the periphery.

Effects: These marks are caused chiefly by inappropriate working conditions, unsuitable gate location or presence of gas or air in cavity.

They have no noticeable influence upon the strength of the casting, but unsightly appearance may result. When castings must be highly polished prior to electroplating, difficulty may be encountered in removing the marks. These marks are confined to the surface, which they penetrate only minutely.

Remedy: If the gate size has been adjusted to insure complete fill of the cavity, injection pressure should be increased while reduction in flow

FOR THE FIRST TIME . . .

A small-foundry kiln type oven with custom features at this standard model low price . . .

This new MOCO Oven is perfect for baking, heating, drying, and curing. It is specially designed and engineered to include many of the features made famous in MOCO's custom-built ovens.

All these features are included in one amazingly low price:

- Operating Temperatures up to 500° F.
- Large Volume Air Recirculation
- Forced Ventilation
- Uniform Temperatures
- Quality Safety Equipment
- Automatic Temperature Controls

GET ALL THE FACTS TODAY

The model shown has a work chamber 4 ft. wide by 4 ft. deep by 6 ft. high and is gas operated. Other Standard sizes are available. For further information, write for this comprehensive folder today.

MICHIGAN OVEN COMPANY

419 BRAINARD · DETROIT 1, MICHIGAN

markings is observed. This treatment can be carried only to a certain point.

If no material improvement results, lack of velocity in alloy flow may be the cause. This condition can be overcome either by enlarging the gate entry slightly or by increasing runner channels or by both.

If these measures do not help, check the working temperature of the die. If it is too low, chilling of the alloy stream may occur in the gate, leading to loss of velocity in flow to the cavity. Increase die temperature at regular intervals, raising it about 20° F each time, and observe effects on trial castings. High die temperature also must be guarded against, for it may lead to flow markings because of increased generation of gases.

Air-vent channels should be checked as to location, capacity and relationship to main flow of alloy charge in the cavity. Examine die lubricants or cavity wall dressings to check gas formation. Die dressings should not be used while flow marks are being investigated.

The suitability of gate location or capacity should be ascertained next. This calls for a more serious modification to the die. If the alloy flow is being interrupted immediately or diverted by a fixed core after leaving the gate or by some other member interjecting into the cavity, it may be advisable to relocate the gate. First, however, the gate opening may be substantially lengthened to a shallow depth at the side farthest from the core. Beneficial results may be gained by this partial reorientation of flow. The increase in gate capacity also steps up velocity through the gate to lessen risks of premature chilling at that point.

If the condition is not cleared up by the preceding measures, the die should be removed from the machine and stripped, the original gate opening blanked up and a new gate provided at a different point. The new gate location is determined by the shape and size of the capacity, the presence of intervening cores, etc., and by the experience gained from application of prior treatments.

Decision to relocate the gate opening should be made only as a last resort on account of the great trouble and costs involved. The greatest care will be required in blanking off the old gate so that noticeable scars or additional flash will not be formed on castings.

Elimination of flow markings requires careful adjustment and balancing of the above factors. Only rarely will a complete solution be obtained by correction of any single cause mentioned.

Porosity Irregularities—Porosity in die castings commonly has one of three causes: 1. Trapped air; 2. Shrinkage in cooling casting in cavity; and 3. Incomplete filling of cavity. We will consider the first and last causes, in order.

Effects: Typical effects of trapped air are depicted in Fig. 3, which shows a large zinc-base casting of cruciform shape. The center boss is cored completely through with a cored opening in the tip of each of the four identical arm portions. Gates were located to feed into the straight side of the lower arm, directly opposite the arm affected by porosity.

A very long flow was involved for the molten charge. The actual porosity is practically confined to the same arm and is comprised of a large number of tiny pockets, some quite deep. The pockets tend to increase in size nearer the end of the arm and to weaken it appreciably. As stock is removed from the face, more numerous pockets may be exposed.

Cause: In this instance the cause of porosity was insufficient air-vent-

Pouring the water-cooled electrode holder shown in the picture below at City Pattern Foundry and Machine Co.

Cleaning a water-cooled electrode holder to smooth out parting lines, gate and riser contacts, etc.

CAN YOU HANDLE BERYLCO?

We will be glad to assist any foundry in handling beryllium copper casting alloys. Write, wire or phone today. For a complete listing of available alloys, write for your free copy of the Berylco Product Directory.

A typical foundry specializing in beryllium copper

City Pattern Foundry and Machine Co., of Detroit, started operations 41 years ago with three men in a 20′ x 30′ room. Today it employs 300 men in a plant area of 50,000 square feet, and can provide a complete service from blueprint to machined castings ready for assembly. Most of the Berylco castings City Pattern produces are of high-conductivity, high-strength beryllium copper alloys for various resistance welding applications. Many welding jaws, resistance welding dies, and electrode holders are now being cast in Berylco, particularly where size and shape requirements—as in the holder shown on the left—prevent the economic use of wrought materials. Berylco resists heat checking, mushrooming and sticking. Its added hardness, as compared with other alloys, gives better service under the high pressures met in welding materials like stainless steel.

THE BERYLLIUM CORPORATION

DEPT. 4M, READING 8, PENNA.

BERYLCO

New York • Springfield, Mass. • Rochester, N.Y. • Philadelphia • Pittsburgh • Cleveland • Dayton • Detroit • Chicago • Minneapolis • San Francisco • Los Angeles

Representatives in principal world-trade centers

ing, coupled with long flow. Pressure and velocity of charge in the cavity were low along this portion, owing to the great distance from the gate and the deflection caused by the fixed central core.

Remedy: First, die temperature was checked. Two difficulties were found. Die temperature was generally too low, and it was distributed unevenly.

Shallow dummy runner channels were cut into the parting joint surface of one die block, one extending up each side of the cavity, but closely situated thereto. At each shot, such channels were filled with hot alloy and, by radiation, assisted in maintaining a uniform thermal balance. In addition, the die was worked at a somewhat higher temperature.

These measures induced better flow into the cavity and reduced premature chilling of alloy in the gate opening, thereby yielding better pressure behind the alloy charge reaching to the extremity of the cavity. This condition facilitated expulsion of air along vents provided. The injecting pressure also was increased, to improve flow and velocity.

Provide Additional Vents

Additional air-vents were provided to the affected portion of the cavity. Two shallow channels were cut axially along the sides of the core shank required to reproduce the cored opening in the tip of the casting arm. Such vents were extended only along the sides of the member fitted within the die block, not on projecting portions. This design allowed air-exit to the rear of the die block.

Two other vent channels were provided across the die parting joint, leading away from the edge of the arm cavity formation.

Use of die dressing was discontinued since it was found to aggravate porosity rather than to alleviate it. Surplus dressing materials were pressed into air-vents and solidified in them. Overheating or burning of these dressings, occurring at each shot, resulted in masses of gas being generated in the cavity. This gas further increased the difficulty of successfully evacuating the cavity area ahead of the alloy charge.

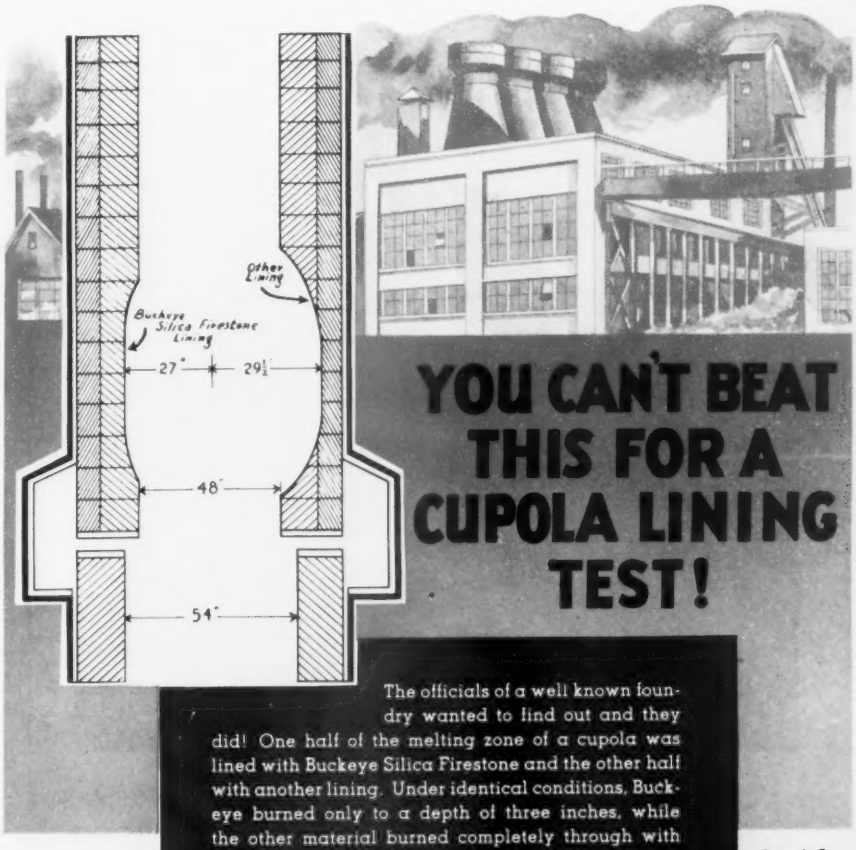
From this account, it will be understood that as a first step attention must be given to the facilities in the die for expelling air or gas from the cavity. Air may be trapped in very deep, restricted or inaccessible pockets remotely situated from the gate entry.

Vent channel capacity and locations should be checked against known chief direction of flow in cavity. This also will be indicated by the presence of porous patches on castings. Attention almost invariably will have to be given to operating conditions—that is, die temperature, pressure and flow velocity through the gate. These features should be adapted to insure most effective expulsion of air or gas and to prevent over-rapid chilling of the alloy. Sometimes increases in die heat and injecting pressure are necessary. In other instances, an increase in gate opening coupled with a slight decrease in pressure may give best results. Much depends upon length of flow and configuration of die cavity.

Dummy runner channels may be adopted to unify die heat. Overflow wells adjacent to coolest portions of the cavity sometimes prove effective.

In persistent cases, all the foregoing remedies should be applied in turn.

In extremely difficult cases, it is necessary to give attention to die design. Alteration of gate location, enlargement of runners, etc., may be required. If overflow wells are adopted, they should be shallow, situated on the die parting joint and



YOU CAN'T BEAT THIS FOR A CUPOLA LINING TEST!

The officials of a well known foundry wanted to find out and they did! One half of the melting zone of a cupola was lined with Buckeye Silica Firestone and the other half with another lining. Under identical conditions, Buckeye burned only to a depth of three inches, while the other material burned completely through with one inch of the backing, next to the shell, also being destroyed!

There is no guesswork when you specify and use Buckeye. You **know** it will do a better job. Its successful application in hundreds of foundries is proof of its importance in your own cupola! Write for full information contained in Bulletin 63.

THE CLEVELAND QUARRIES COMPANY
REFRACTORY DEPT.
AMHERST, OHIO

Send for this FREE BOOK

BUCKEYE
"FOR THAT EXTRA SERVICE"
SILICA FIRESTONE

connected to the main cavity by shallow runner channels at the point where greatest air-trapping occurs.

Their purpose is to allow air or gas to be swept from restricted portions of the cavity ahead of the incoming alloy charge, into such wells. Waste alloy cast into these portions will be in a porous state and leave adjacent portions of the casting sound.

In operation of the corrected die, close attention must be given to working conditions to insure that inadvertent deviations from established factors do not lead to a recurrence of porosity troubles. It also will be necessary to employ strict inspection tests on castings by weighing specified samples at regular intervals.

Trapped-air porosity often may be present without any outwardly visible signs on castings. The condition may be wholly situated slightly under the outer skin, discernible only when the casting is broken or sawed.

Incomplete Filling of Cavity—Of the three common kinds of porosity, the one caused by incomplete cavity fill generally is the simplest to correct. It may, however, have devastatingly bad effects on strength, durability and appearance. Usually the condition is clearly distinguishable, as depicted in Fig. 4.

This illustration shows two similarly shaped zinc-base alloy castings, one (at top) affected by porosity, the other free from it. Each part is cored out from the large end to leave relatively thin side and end walls. Part at top has a long, projecting cylindrical stalk cast on the large end; the other casting has a large-diameter, tapered blind hold.

Single-impression dies were used to produce these parts, each having the entire cavity formation contained in the stationary die block, with a core and core-slide mechanism mounted in movable die halves. The flat (slotted) base lies along the main parting joint in the die, in both instances.

Gate on Parting Line

The gate feed was located along the parting line to run into the small end of the casting, parts being produced from a center-sprue die in the vertical position. This die layout resulted in a long flow, which was intercepted by the large core required for the internal opening.

Effects: Surface finish of the top casting is extremely bad, and side walls are interrupted by several openings, one quite large, from each of which radiate several long seams and folds. These indicate distinct cleavages in wall structure, the respective edges of which are smooth and fairly regular. The edges of the large openings in the wall are similarly regular, not jagged.

The condition usually is worsened by the presence of scab patches, sinkage and roughened spots. There also may be innumerable fine cracks because the weak wall structure is incapable of resisting shrinkage pressures when the shell-like casting cools.

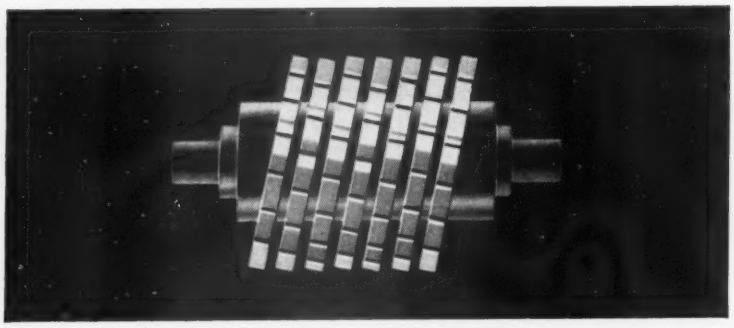
Usually such effects are most manifest at points furthest removed from the gate, at portions where flow is most greatly diverted or walls are thinnest. In some instances, the casting may appear to be almost fully formed externally, but with others great voids may occur.

Causes: The causes of the incomplete fill in this casting are quite typical: 1. An excessively inadequate gate opening; 2. Long, intersected flow; 3. Low velocity flow; and 4. Insufficient die heat.

A considerable proportion of the charge was being chilled at the gate, thus arresting flow in the cavity. Such freezing diminished velocity and pressure of the actual charge

new ANGLE

for heavy-duty dressing



Desmond's Heavy Duty Dresser makes quick work of truing large, high speed rubber- or resinoid-bonded grinding wheels. Shears and picks at same time with patented angle-set Desmond-Huntington cutters. Dust-shielded ball bearings guarantee lasting precision. Cutters easily replaceable without adjusting bearings. Ask your Desmond distributor how proper dressing can make your grinding wheels serve better—longer.

THE ONLY COMPLETE LINE OF GRINDING WHEEL DRESSERS AND CUTTERS

Desmond

THE DESMOND-STEPHAN MFG. CO., URBANA, OHIO

entering the cavity so that it was unable to reach all portions of the large cavity before solidifying. This condition applied especially to advance layers and to those which had to form the overthin side walls.

Remedy: To correct these conditions, the gate opening was increased in depth by about 35 per cent. Next, pressure was increased 8-10 per cent and die temperature was stabilized at a higher level. Each of these remedies was applied separately, and results were noted carefully. Since the condition did not disappear entirely, capacity of the runner channel was increased by 40 per cent to permit delivery of a greater volume of alloy.

Complete elimination was secured by removing the main movable core and reducing its width so as to form casting walls approximately 15 per cent thicker than before. This step gave a slightly larger cavity opening along which the main portion of charge could flow to remote parts.

It is always advisable to adjust the gate in a series of stages, making a predetermined scale of enlargement at each stage. Results should be checked consistently against action at each stage. This care is necessary to guard against making the gate over-size, a condition which would lead to other troubles. To induce more rapid filling of the cavity, runners may have to be considerably enlarged, as well as the gate.

Conclusion: Chief features of a corrective policy include the following: 1. Determination of all probable causes at work and of the order of their precedence and effects; 2. Discovery of whether such causes are associated with die, alloy, machine or working conditions; 3. Decision as to most appropriate corrective treatment; 4. How far proposed remedial treatments may affect design forms, dimensions or accuracy of finished castings, and whether such variations will be permissible; 5. Whether applied remedies will be simply ameliorative or will insure complete, permanent elimination of the trouble.

Titanium Research Made Available to Industry

More than 300 titanium research reports are described in a 26-page listing published recently. The listing, CTR-306, was published by the U. S. Department of Commerce's Office of Technical Services to help keep industry abreast of the latest advances in titanium technology. It may be purchased from the Office of Technical Services, U. S. Department of Commerce, Room 6227, Washington 25. Price is 50 cents.

Produce cleaner forgings

. . . with ladle linings made of J-M 3X Blazecrete® — the hydraulic setting refractory

J-M 3X Blazecrete makes possible cleaner forgings because it has great ability to resist penetration and attack by molten metal.

3X Blazecrete . . . the 3000F refractory . . . is easily and quickly applied . . . mix with water like ordinary concrete, and slap-trowel to desired thickness. Hardens without application of heat. Contains no harmful irritants . . . safe even for hand application. 3X Blazecrete is furnished as a dry mix, and may be stored indefinitely without deterioration.

Longer lasting linings can be built with 3X Blazecrete because it is spall-resistant, withstands slagging action and has negligible shrinkage.

Send for free brochure on Blazecrete (RC-28A) describing its properties and uses. To obtain your copy—as well as additional application details—write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay Street, Toronto 1, Ontario.

Whether you gun it... *or slap-trowel it...*

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville BLAZECRETE

BUILDS BETTER REFRACTORY LININGS

PURDUE METALS CASTING CONFERENCE

Considers Ways To Cut Operating Costs

By WILLIAM G. GUDE
Managing Editor

DISCUSSION of ways to improve efficiency of foundry operations and reduce costs dominated the program at Purdue's seventh annual Metals Casting Conference. The meeting, sponsored by the university's Department of General Engineering and the Michiana and Central Indiana Chapters of the American Foundrymen's Society, was held at West Lafayette, Ind., Oct. 28-29. Attendance was nearly 200.

Vern S. Spears, American Wheelabrator Corp., Mishawaka, Ind., served as conference chairman.

Official welcome by the university was extended at the opening session by Dr. Frank C. Hockema, vice president and executive dean. The response was made by William W. Maloney, AFS secretary-treasurer, who discussed some of the activities of the national organization.

Great opportunities exist today for cutting costs through correct design and efficient manufacture of castings. This was brought out in a talk by William G. Ferrell, vice president, Auto Specialties Mfg. Co., St. Joseph, Mich. The inherent advantages possessed by castings as an engineering material should encourage foundries to adapt cast products to many applications now filled by forgings, weldments or stampings, he declared. Outstanding instances in which this has been done include engine crankshafts, military tank parts and artillery shells.

Pattern design should be the result of close co-operation between the engineer, patternmaker and various foundry departments, it was stated by Nelson Damm, Pyle Pattern Co., Muskegon, Mich. Speaking on "Good Pattern Design Is Everybody's Business," he mentioned these factors as important: Molding conditions and type of labor that will use the patterns; provision for accurate core setting; incorporation of an efficient gating system; location of fins to permit accessibility in cleaning the castings; consideration of machining requirements. Patterns should be designed for easy operation and so as to minimize maintenance on them, he said.

Work simplification involves standardization of various operations and methods analyses, it was pointed out by W. C. Cheek, Central Foundry Division, General Motors Corp., Danville, Ill. Discussing cost savings through work simplification, he said that while time study can be used to standardize operations, the worker must be trained in each phase and also must be adapted to the particular job. Methods should be subjected to constant study to improve them. Mr. Cheek showed a film describing various foundry operations which were made more efficient by changes in methods or equipment. In some cases this involved only a difference in location of the work in relation to the operator.

"Back Slagging and Hot Blast" was discussed by G. P. Phillips, International Harvester Co., Chicago. He indicated that back slagging is most economical for cupolas operating on small to medium heats. Hot blast use is increasing, stimulated by resultant savings in coke and refractory costs, reduction in sulphur pickup, more consistent operation and a minimum of bridging. Mr. Phillips described various examples of the recuperative and external-fired types of hot blast, pointing out the advantages and disadvantages of the two types.

Speaking on "Front Slagging and Moisture Control," O. L. Wilhelm, Delco-Remy Division, General Motors Corp., Anderson, Ind., listed these advantages for front slagging: Better housekeeping, less maintenance, improved safety, less labor, more uniform carbon analyses. He described his foundry's use of a refrigeration unit to regulate moisture content of the blast. This control corrected a condition in which scrap castings caused by gas defects increased directly with the moisture in the atmosphere. Trouble occurred when moisture exceeded 4 grains per cubic foot.

Discusses Sand Control

Automatic control of moisture in molding sand was discussed by two speakers. W. E. Patterson, Elkhart Foundry & Machine Co., Elkhart, Ind., described operation of the Dietert moisture control equipment in his plant. Among advantages of the system, he mentioned: Stabilization of permeability and green strength of the sand; improved flowability; consistent hardness in ramming by sandslinger; less manpower required to control moisture.

The moisture control system of Haylco Controls Corp. was described by E. C. Zuppann, Oliver Corp., South Bend, Ind. An additional advantage of automatic moisture regulation listed by Mr. Zuppann is the greater output attained by the muller. He said batch sizes can be increased 35 per cent, or a corresponding reduction in current consumption can be made with the same size batches compared with former practice.

Major function of the cleaning room, in addition to performing its

(*Concluded on page* 240)

Vern Spears (left), American Wheelabrator Corp., was Purdue conference chairman. J. P. Lentz (center), International Harvester Co., and R. H. Greenlee, Auto Specialties Mfg. Co., served as program chairman and assistant chairman

Col. Ky Clay says:

THERE ARE SIX MIGHTY GOOD REASONS FOR LINING LADLES WITH IRONTON BERLITE

You'll be seeing more of Col. Ky Clay, Ironton's spokesman for the merits of Kentucky clay refractories. He will never make a claim you can't test or find supported by good authority. That's why, right now, you can take his word for the superiority of *IRONTON* BERLITE for lining hand, bull and transfer ladles.

Check these reasons why *IRONTON* BERLITE cuts down on ladle repairs and relining. √Cold metal and slag peel off easily. √*IRONTON* BERLITE has unusually high refractoriness √ excellent workability as mortar, mud or ramming material √high strength √exceptional resistance to slag and metal erosion. √*IRONTON* BERLITE won't shrink, bloat or peel off from the ladle. Write today or call Ironton 109 for details.

Berlite lasts 5 to 40 times longer

MONEY-SAVERS for FOUNDRIES

IRONTON BERLITE
Special purpose Super-duty refractory lining material.

IRONTON NOJOINT
High Duty plastic for furnace linings and all-around foundry use.

IRONTON RAVENITE
New black plastic with "non-wetting" feature, for ladles, cupola, etc.

IRONTON CARO-LINE
Siliceous lining for acid elecuric furnaces, bessemers, and ladles.

IRONTON DE-RITE
Super Duty plastic for extra slag resistance in hard service.

IRONTON SPECIALTIES FOR CUPOLA OPERATION
Slag hole blocks, tap holes, cupola spout brick, etc.

GRANULAR LADLE COVER
The new "shovel on" top insulation for holding heat in all ladles.

IRONTON FIRE BRICK
A best buy in any grade; made from Kentucky flint and semi-flint clays.

THE IRONTON FIRE BRICK COMPANY
IRONTON, OHIO

RELIABLE REFRACTORIES

Representatives reached by phone in these cities:

BALTIMORE, Md. MUlberry 7184
BIRMINGHAM, Ala. Phone 4-4754
BOSTON, Mass. HAncock 6-1210
BUFFALO, N. Y. TAylor 2091
CHATTANOOGA, Tenn. Phone 7-6697
CHICAGO, Ill. Rldlid 2-7770
CLEVELAND, O. CHerry 1-0711
CLEVELAND, O. VUlcan 3-8200
DETROIT, Mich. WOodward 3-8123
HARTFORD, Conn. Phone ADams 3-0941
JACKSONVILLE, Fla. Phone 3-5586
KENTWOOD, La. Phone 2191
LYNCHBURG, Va. Phone 3-8274
MIAMI, Fla. Phone 82-5782
MILWAUKEE, Wis. BRoadway 6-4790
PHILADELPHIA, Pa. JEfferson 5-1012
ST. PAUL, Minn. EMerson 6312
SEATTLE, Wash. MAin 4330
SPOKANE, Wash. MAin 1644

Want the Ironton office direct? Phone Ironton 109, or 110

Committee members for the Purdue conference included, left to right: K. E. Glancy, C. T. Marek, Purdue; J. H. Kauffman, Studebaker Corp.; W. E. Patterson, Elkhart Foundry & Machine Co.; N. E. Baker, Nonferrous Foundries Inc.

(*Concluded from page* 238)

normal operations, is to help the foundry keep casting costs at a minimum and to give the customer quality castings at a competitive price. To accomplish this, according to H. A. Graber, Studebaker Corp., South Bend, Ind., the cleaning room supervisor must pay constant attention to communications — regular contact with other departments—production control and cleaning room costs. Prompt detection of defective castings and immediate advice to the molding and coremaking departments can result in important savings.

Production control, according to the speaker, requires constant search for improvement in such things as the flow of castings through the department, the processes and equipment, operations and their sequences, and quality standards. Savings in cleaning room costs result not only from employing the equipment and abrasives best suited to the job but also from salvaging the greatest possible number of castings.

Annual conference dinner, held Thursday evening, had a number of engineering students as guests. J. P. Lentz, International Harvester Co., Indianapolis, and program chairman for the conference was toastmaster. Principal speaker was Ivan L. Willis, vice president in charge of industrial relations, International Harvester Co., Chicago. He discussed some of the problems encountered today in attempts to attain harmonious relations between management and employees.

CASTINGS ARE DISPLAYED WIDELY

At National Metal Congress and Exhibition

By EDWIN BREMER
Metallurgical Editor

AMPLE evidence that the foundry industry is basic was presented by metalworking and allied equipment shown by over one-fourth of the more than 435 exhibitors at the 36th National Metal Congress and Exhibition.

Held at the International Amphitheatre, Chicago, during Oct. 30 through Nov. 5 the congress was attended by over 50,000 and was sponsored jointly by the American Society for Metals, American Welding Society, Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers and the Society for Non-Destructive Testing.

Annual meeting of ASM was held on Wednesday morning, with James P. Gill, Vanadium Alloys Steel Co., Latrobe, Pa., presiding. He introduced the newly elected officers, including the president, George A. Roberts, Vanadium Alloys Steel Co.; vice president, Adolph A. Schaefer, Midvale Co., Nicetown, Pa., and trustees Walter Crafts, Electro Metallurgical Division, Union Carbide & Carbon Research Laboratories, Niagara Falls, N. Y., and Karl L. Fetters, Youngstown Sheet & Tube Co., Youngstown, O.

The Sauveur Achievement Award was presented to Alexander L. Feild, Armco Steel Corp., Middletown, O. William F. Umstattd, Timken Roller Bearing Co., Canton, O., received the 1954 Medal for the Advancement of Research. The Campbell Memorial Lecture was given by Kent R. VanHorn, Aluminum Co. of America and dealt with "Factors Affecting Directional Properties in Aluminum Wrought Products."

Many foundries aware of the merchandising possibilities as well as the opportunity for promotion of the use of ferrous and nonferrous castings had displays in the exhibition. They included the following: Al-Fin Division, Fairchild Engine & Airplane Corp., Farmingdale, L. I., N. Y.; Allegheny Ludlum Steel Corp., Pittsburgh; Alloy Engineering & Casting Co., Champaign, Ill.; American Brake Shoe Co., New York; American Cast Iron Pipe Co., Birmingham; Arwood Precision Casting Corp., Brooklyn, N. Y.; Morris Bean & Co., Yellow Springs, O.; Beryllium Corp., Reading, Pa.; Cadmet Corp., Detroit; Casting Engineers Inc., Chicago; Dow Chemical Co., Midland, Mich.; Driver-Harris Co., Harrison, N. J.; Fansteel Metallurgical Corp., North Chicago, Ill.; General Alloys Co., Boston.

Haynes Stellite Co., Kokomo, Ind.; Hills-McCanna Co., Chicago; R. C. Hitchcock & Sons Inc., Minneapolis; Hitchener Mfg. Co., Milford, N. H.; Howard Foundry Co., Chicago; Janney Cylinder Co., Philadelphia; Kolcast Industries Inc., Cleveland; Lynchburg Foundry Co., Lynchburg, Va.; Michiana Products Corp., Michigan City, Ind.; Michigan Steel Castings Co., Detroit; National Lead Co., New York; Ohio Steel Foundry Co., Springfield, O.; Precision Castings Co. Inc., Syracuse, N. Y.; Precision Metalsmiths Inc., Cleveland; Pressco Castings & Mfg. Co., Chesterton, Ind.; Shenango-Penn Mold Co., Dover, O., Universal Castings Corp., Chicago, and Yale & Towne Mfg. Co., Franklin Park, Ill.

West Coast Plans Ninth Metal Exposition

Pan-Pacific Auditorium, Los Angeles, will be the site of the ninth Western Metal Exposition, Mar. 28 through Apr. 1. Twenty prominent technical societies are sponsoring the exposition which will use 150,000 sq ft of floor space. On the dates of the show, the ninth Western Metal Congress also will take place in Los Angeles' Ambassador Hotel. Over 50,000 are expected to attend the show and technical programs, round tables and question-answer periods conducted by technical societies devoted to the production, treating, machining and fabrication of metals.

The California Regional Foundry Conference, sponsored by West coast AFS chapters, is to be held just preceding the congress, on Mar. 26-27 at the Ambassador Hotel, Los Angeles.

Steels for *Agriculture*

GLC GRAPHITE ELECTRODES help make the wide range of steels required in the manufacture of agricultural buildings, equipment, machines and tools.

The performance of GLC GRAPHITE ELECTRODES is unsurpassed in the processing of electric steels, foundry castings, ferroalloys and magnesium. Our facilities have been greatly expanded to keep pace with the growing emphasis on electric furnace steel production.

ELECTRODE DIVISION

Great Lakes Carbon Corporation

Niagara Falls, N.Y. GLC® Morganton, N. C.

Graphite Electrodes, Anodes, Molds and Specialties

Sales office: Niagara Falls, N.Y. **Other offices:** New York, N.Y., Oak Park, Ill., Pittsburgh, Pa.

Sales Agents: J. B. Hayes, Birmingham, Ala.; George O'Hara, Long Beach, Cal.; Great Northern Carbon & Chemical Co., Ltd., Montreal, Canada

Overseas Carbon & Coke Company, Inc., Geneva, Switzerland; Great Eastern Carbon & Chemical Co., Inc., Chiyoda-Ku, Tokyo

Berliet Foundry

(*Concluded from page* 93)

shakeout knocks out the castings at the end of each line, and the empty flasks are returned to the molding station by roller conveyors.

For cylindrical castings, a battery of ten centrifugal casting machines is installed at the end of the foundry, around a revolving circular platform. Iron is melted in two ½-ton (500-kg) rotary electric furnaces with horizontal electrodes. Metal is poured through channels made up of core sand.

Trimming and Cleaning—Cleaning equipment includes two rotating blast cleaning tables, a tumbling barrel and two sand blast cabins. Each day 54 tons of castings, from a melt of 80 tons, are treated in this department. Main spurs and heads are cut off with pneumatic chisels. Castings are brought to the trimming station by overhead conveyors which go around the foundry to allow the castings to cool. Fig. 8 shows heavy castings being brought to the cleaning station. Smaller castings are cleaned in the tumbling barrel, and final trimming is done with abrasive wheels. Heavier burrs are cleaned off with swing grinders. All parts which are in contact with oil when in use are painted.

A number of castings have to undergo a normalizing heat treatment. This is done in three 10-ton electric furnaces with recirculation of gases and controlled cooling. Heating is by resistances. Two cycles are used according to the type of casting: One is 550°C for 2 hr, the other 659°C for 2½ hr.

Control—All patterns are examined for accuracy before being used in the foundry. Before a new series of castings is started, a few test castings are made, examined, tested and analyzed. Once actual production has started, all parts are tested each day for dimensional accuracy and appearance. Certain parts, such as cylinder blocks, are traced entirely and plotted in the foundry before being machined.

Laboratories for metallurgical control include facilities for sand testing; mechanical testing for tensile strength, hardness, etc.; extensive chemical laboratories and a laboratory for metallographic examination. Raw materials are controlled at their arrival, and routine testing of metal and castings is carried out continually.

Experiments are being made with a view to casting nodular iron crankshafts for diesel engines used in Berliet commercial vehicles. The experiments are being made under Mond Nickel license. Fig. 9 shows three prototype crankshafts made by this method.

Steel Foundry—The layout of the steel foundry is similar to that of the iron foundry. Parts made in the steel foundry are for gear boxes, wheel hubs and various fittings. Production is at the rate of 500 tons of finished castings per month.

Steel is melted in four laterally blown converters of 1½ to 2 ton capacity. While two converters are in use, the other two stand by for repairs and relining.

Iron comes from a basic-lined, water-cooled cupola, one of the first to be used in France. The adoption of this cupola arises from the immediate postwar shortage of electric power and the high price of current, which induced the company to melt its steel in converters instead of in electric furnaces. In order to obtain a steel with the same characteristics as electric steel, it was necessary to desulphurize the cupola iron.

During his visit to the United States in 1947, the foundry manager of Berliet studied the triplex method used in the foundries of Campbell, Wyant and Cannon, but it was found to be economical only for a daily output of 60 tons. Other alternatives were either to use the soda ash process in the forehearth or to use a basic cupola.

Because of the high cost of basic lining, means were studied to reduce the consumption of refractory. As a result, the present method was used: The cupola hearth is lined up to 150 mm above the tuyeres, the stack is cooled by water running on the outside, and cold blast is used. Composition of the charges is as follows: 250 kg of briqueted steel turnings from the machine shop; 150 kg of flashing from the forge shop; 150 kg of steel scrap; 60 kg of new iron; 110 kg of coke; 55 kg of limestone; 6 kg of fluorspar; 6 kg of calcium carbide, and 6 kg of silicon briquets.

Composition of the resulting iron is: C, 3.30 per cent; Si, 1.5 per cent; Mn, 0.50 per cent; P, 0.03 per cent; and S, 0.035 per cent. Only addition to converter is a deoxidizer.

"Tumbler's motor burned out this morning!"

Cores for steel castings are made of a sand incorporating sodium silicate, which hardens in air, so that no baking is required. Cores are carried to the molding lines by an overhead conveyor system which serves the seven molding stations. Length of this conveyor, which travels below the roof of the foundry, is 400 m.

Molding and coring up follow the same principles as in the iron foundry. Heat treatment of the steel castings is done in electric furnaces with movable hearths. Castings are heated for 1 hr at 935° C, then cooled in air.

The whole group of foundries, including nonferrous and aluminum, is under the direction of R. Baumes. The company has its own planning and drawing department for studying patterns, cores and molds, and the laboratories include a research section investigating new processes and developments such as shell molding, synthetic sands, acicular iron, nodular iron, etc.

Vacuum Degassing

(*Continued from page* 83)

induction melting, whereas in gas melting the crucible is much hotter because of the impingement of the flames. In fact, because of heat flow from the hotter crucible, metal melted in a gas-fired furnace will show an increase in temperature of approximately 30° F prior to beginning of cooling.

Effectiveness of the Degassing Unit—The test casting employed for initial study of effectiveness of the NRL foundry degassing unit was a step bar, Fig. 5A, comprised of joined 1, 2, and 3-in. thick members of square cross section. Castings were poured in air-dried molds made of a silica sand (AFS fineness No. 80) bonded with 3 per cent water, 3 per cent bentonite and 1 per cent cereal. The bars were sectioned longitudinally, and the cut surface of one of the sections was machined so that the degree of porosity could be observed.

In all instances, undegassed bars were poured from the same heat at the same temperature as the degassed bar in order to observe the improvement resulting from the degassing treatment. The procedure followed was to heat the melt to the desired pouring temperature and cast the untreated bar; the crucible containing the remainder of the metal was replaced in the furnace, superheated, subjected to the degassing treatment and poured at the same temperature as the first bar.

The following aluminum alloys

(*Continued on page* 246)

Dear Reader:

This page has been provided for your convenience. Use one of the return cards attached for *more information* on advertisements in this issue.

FURTHER INFORMATION on any of the advertisements in this issue may be obtained by circling the page numbers of advertisements on one of the attached cards. Fill in your name and address, return your card to us—we'll forward your requests to the companies concerned. Further information on their advertisement will come direct to you from the advertiser. *Note: where more than one advertisement appears on a page, the following code is used for identification:* R (right); L (left); T (top); B (bottom); 1-2-3-4 (in order from top to bottom); IFC (inside front cover); IBC (inside back cover); OBC (outside back cover).

● For further information on helpful literature, trade publications, and new equipment descriptions, please refer to IDEAS FOR FOUNDRYMEN insert and return cards on page 209.

FOUNDRY Readers Service

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
Cleveland, Ohio

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States

4c POSTAGE WILL BE PAID BY—

FOUNDRY
Penton Building
Cleveland 13, Ohio

Readers Service Dept.

DECEMBER 1954

IFC	27	54	76	153	193	225	251T	259BL
1	28	55	109	155	194	226-7	251B	259R
2	29	56	111	157	197	229	252L	260R1
4-5	30-31	57	113	159	198	231	252R	260R2
6	32	58	115	160	201	232	253T	260R3
7	35	59	117	162-3	203	233	253B	260R4
8	36	60	119	165	205	234	254T	261T
9	37	61	121	167	208	235	254B	261BL
10	38	62	122	169	211L	236	255T	261BR
11	39	63	124-5	172-3	211R	237	255B	262L1
12	40-41	64	127	175	212	239	256L	262R1
13	42	65	128	176	213	241	256TR	262-2
14-15	43	66	130-1	178	214	246L	256BR	262L3
16	44	67	134	179	215L	246R	257T	262R3
17	45	68	136-7	180	215R	247T	257L2	262L4
18	46	69	139	183	216-7	247B	257L3	263TL
19	47	70	141	185	218	248T	257BR	263BL
20	48	71	142	187	219	248B	258T	263R
21	49	72	145	188	220	249L	258BL	272L
22-23	50	73	146	189	221	249R	258R2	276
24	51	74	148-9	190	223	250T	258R3	IBC
25	52	75	151	192	224	250B	259TL	OBC
26	53							

THIS CARD VALID FOR USE IN UNITED STATES AND CANADA ONLY

PLEASE SEND further information on the advertisements appearing on the pages which are circled above.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY & STATE _____

This card MUST be completely filled out. Please TYPE or PRINT

DECEMBER 1954

IFC	27	54	76	153	193	225	251T	259BL
1	28	55	109	155	194	226-7	251B	259R
2	29	56	111	157	197	229	252L	260R1
4-5	30-31	57	113	159	198	231	252R	260R2
6	32	58	115	160	201	232	253T	260R3
7	35	59	117	162-3	203	233	253B	260R4
8	36	60	119	165	205	234	254T	261T
9	37	61	121	167	208	235	254B	261BL
10	38	62	122	169	211L	236	255T	261BR
11	39	63	124-5	172-3	211R	237	255B	262L1
12	40-41	64	127	175	212	239	256L	262R1
13	42	65	128	176	213	241	256TR	262-2
14-15	43	66	130-1	178	214	246L	256BR	262L3
16	44	67	134	179	215L	246R	257T	262R3
17	45	68	136-7	180	215R	247T	257L2	262L4
18	46	69	139	183	216-7	247B	257L3	263TL
19	47	70	141	185	218	248T	257BR	263BL
20	48	71	142	187	219	248B	258T	263R
21	49	72	145	188	220	249L	258BL	272L
22-23	50	73	146	189	221	249R	258R2	276
24	51	74	148-9	190	223	250T	258R3	IBC
25	52	75	151	192	224	250B	259TL	OBC
26	53							

THIS CARD VALID FOR USE IN UNITED STATES AND CANADA ONLY

PLEASE SEND further information on the advertisements appearing on the pages which are circled above.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY & STATE _____

This card MUST be completely filled out. Please TYPE or PRINT

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
Cleveland, Ohio

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States

4c POSTAGE WILL BE PAID BY—

FOUNDRY
Penton Building
Cleveland 13, Ohio

Readers Service Dept.

Dear Reader:

This page has been provided for your convenience. Use one of the return cards attached for *more information* on advertisements in this issue.

FURTHER INFORMATION on any of the advertisements in this issue may be obtained by circling the page numbers of advertisements on one of the attached cards. Fill in your name and address, return your card to us—we'll forward your requests to the companies concerned. Further information on their advertisement will come direct to you from the advertiser. *Note: where more than one advertisement appears on a page, the following code is used for identification:* R (right); L (left); T (top); B (bottom); 1-2-3-4 (in order from top to bottom); IFC (inside front cover); IBC (inside back cover · OBC (outside back cover).

● For further information on helpful literature, trade publications, and new equipment descriptions, please refer to IDEAS FOR FOUNDRYMEN insert and return cards on page 209.

FOUNDRY Readers Service

ANOTHER New England within the next 4 years

In making plans for the future it's surprising how many of us act as if *growth* were something that is entirely *behind* us!

Maybe that's because we're accustomed to making comparisons of yesterday and today. There's no question about the growth we've had since '40 or '47. Most everyone is now taking this growth into consideration in today's planning.

But what about the growth *ahead* of us? The next time you sit in a planning conference, try this little bombshell:

> **The increase in our population *within the next four years* will be the equivalent of adding *another New England* to the U.S.**

That's just one example of how fast America is *continuing* to grow.

Visualize the opportunity ahead for your Company in such a dynamic and expanding economy. But making the most of such an opportunity is going to take some raising of sights. It's going to require sound sales and advertising planning based on the size of the job *ahead*, and not the size of the job *behind* us.

For help in your planning we invite you and your advertising agency to make full use of the information facilities of the Penton Publishing Company. We will be happy to cooperate with you.

THE PENTON PUBLISHING COMPANY

PENTON BUILDING • CLEVELAND 13, OHIO

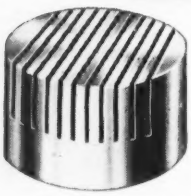
MANUFACTURERS OF PRECISION MACHINED-GROUND PARTS TOOLS-GAGES-FIXTURES

nothing takes the place of PRECISION and PERFORMANCE

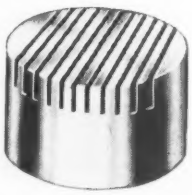
CORE BOX VENTS

"A Specific Type for Every Core Box"

Slotted



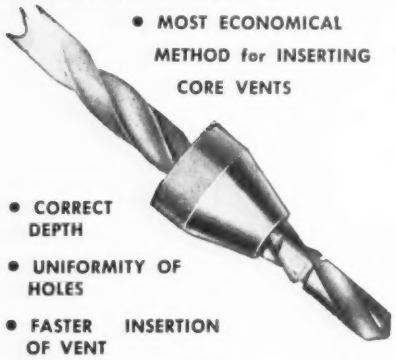
X-TRA DEEP HEAD .156 Wide Slots .014



DEEP HEAD .093 Wide or Narrow Slots .014 .010

SHALLOW HEAD .031 Wide or Narrow Slots .014 .010

INSERTING DRILL



- MOST ECONOMICAL METHOD for INSERTING CORE VENTS
- CORRECT DEPTH
- UNIFORMITY OF HOLES
- FASTER INSERTION OF VENT

VENT CLEANER

- FOR CLEANING SLOTS
- MADE OF TEMPERED STEEL
- EASY TO USE

C.M. SMILLIE & CO.

1124 WOODWARD HGTS., FERNDALE 20, MICH

(*Continued from page* 242)

were investigated in this manner with respect to the effects of pressure level, holding times, and pouring temperatures: 8 per cent copper; 4½ per cent copper; 4½ per cent copper—1 per cent silicon; and 7 per cent silicon.

It was observed that pouring temperature had an appreciable effect on the degree of porosity developed in the undegassed bars. In general, higher pouring temperatures aggravated porosity. The effect was most pronounced in the heavy section which had the lowest degree of directional solidification. Degassing effectively eliminated porosity, as illustrated in Fig. 9, which represents the instance of high pouring temperature and therefore the worst porosity condition for metal which has not been degassed.

Degassing Improves Quality

Improvements of this magnitude were obtained consistently with all alloys investigated. It is not implied that porosity conditions like those illustrated were always obtained, but that all cases of bad porosity conditions obtained in the first split (undegassed metal cast) were, depending on the pouring temperature, either completely or almost completely eliminated by the degassing treatment. That is, it was not important how "bad" the initial metal was insofar as the degassing treatment was concerned. If the pouring temperatures did not exceed 1250° F, the castings were completely sound. With high pouring temperatures, from 1300 to 1350° F, small traces of porosity sometimes were noted. Fig. 10 illustrates other "before and after" conditions for various alloys and pouring temperatures. These are representative of the results of a great many tests. To avoid excessive size reduction in photography, only the "corner" regions between the intermediate (2-in.) and heavy (3-in.) sections of the step casting are shown.

The reader may recognize from the above and other illustrations to follow, that in the "before" and "after" examples, the conditions of the "before" are worse than may be expected in practice. It should be explained that there was no attempt to treat the metal in any way except by degassing. In fact the development of poor quality metal was desired, for then the full effect of degassing could be evaluated. The various examples shown illustrate that vacuum degassing is fully effective by itself and that the usual chemical treatments are not required. For example, cathode copper which contains large amounts of hydrogen gas

PYRO

Instruments for precision temperature measurement

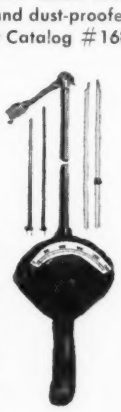
The Simplified PYRO Optical Pyrometer

The only completely self-contained and direct reading Optical Pyrometer for quick and accurate temperature measurements of molten iron, steel, monel, etc. No calibration charts or accessories required. Weighs only 3 lbs. PYRO will pay for itself many times over by helping prevent spoilage. Write for Catalog #85.

The Improved PYRO Surface Pyrometer

The ideal instrument for quick and accurate surface temperature measurements—particularly for shell molding, core oven, mold and die temperatures. Designed for ruggedness and accuracy it features automatic cold end compensator, large 4¾" direct reading dial and shock, moisture and dust-proofed shielded steel housing. Ask for Catalog #168.

The New PYRO Immersion Pyrometer



Helps insure low-cost production of SOUND and UNIFORM non-ferrous castings. Withstands roughest handling. "Protected Type" and "Bare Metal" thermocouples instantly interchangeable. Equipped with exclusive LOCK SWIVEL. Stock ranges from 1000°F to 2500°F. Ask for Catalog #155.

THE PYROMETER INSTRUMENT COMPANY inc.

Bergenfield 6, New Jersey, U. S. A.

may be melted directly (not prepigged) and poured to produce sound castings without any treatment except vacuum degassing.

Other tests with this type of casting have been conducted for gun metal bronze, pure copper, monel, aluminum bronze, manganese bronze and aluminum-5 per cent magnesium alloys. In all instances, porosity, purging and other conditions caused by the presence of gas were eliminated effectively. Fig. 11 illustrates examples involving pure copper and monel. At this writing, the full limits of applicability of the equipment are not known, and work is continuing to establish these limits.

It is emphasized that vacuum degassing of melts is not a cure-all for the porosity problems since gas is not the only factor affecting soundness. Castings require adequate directional solidification in addition to gas-free metal in order to realize complete soundness. Degassing is a complement, not a substitute, of proper risering and gating practices.

Improves Finished Appearance

In the Naval Research Laboratory foundry it is necessary to make castings of various aluminum alloys for experimental equipment, and for approximately ten months since the development of the unit it has been the practice to vacuum degas all of these alloys instead of using the former chemical or gas flushing treatments. A great improvement has been noted in the appearance of the castings after machining, from the standpoints of both cleanliness and freedom from porosity. Fig. 14 presents examples of typical castings illustrating complete freedom from defects attained by vacuum degassing.

Fig. 12 illustrates castings of high-conductivity copper after machining. No treatment of any kind except vacuum degassing was used in producing a large number of these castings. Prior experience with castings of this type at the NRL foundry involved the usual difficulty with porosity associated with pure copper.

An example of the elimination of riser purging by the vacuum treatment is illustrated in Fig. 13 for tin bronze (12 per cent tin, balance copper). The two bars were melted from the same stock under the same conditions and poured at the same temperature into 4 x 4 x 30-in. bars. No treatment of any kind except degassing of the metal for one bar was employed. Fig. 15 illustrates the internal condition of the two bars; the improvement due to vacuum degassing is readily apparent.

★ ★ ★ This is where PATTERNS of quality and precision are produced for the automotive, aircraft and metalworking fields . . . backed by 35 years of know-how.

★ ★ ★ These superior PATTERNS are produced under the personal supervision of the two owners and a highly skilled group of employees.

★ ★ ★ The owners are naturally proud of their reputations. That's your guarantee of quality work and reasonable prices. Let them give you a quotation on your next job—and give you a pleasant surprise.

AUTOMOTIVE PATTERN Company

Wood and Metal Patterns

18840 John R. St., Detroit, Michigan

"FALLS BRAND" ALLOYS

AMERICA'S LARGEST PRODUCERS OF ALLOYS

IMPROVED CASTING PRODUCTION with "FALLS" ANTI-PIPING COMPOUND "B"

Use: In production of small and large castings and ingots to reduce depth of pipe without causing segregation; to make certain that castings are properly fed and have uniform grain structure, regardless of size of finished product.

Form: Powder packed in handy containers. Will cause no change in chemical analysis since it contains no contaminating elements.

Benefits: When applied on heads and risers, permits proper feeding of castings without hand-pumping or churning; reduces size of heads and risers; eliminates cavities and porosities. When added by ladle, refines grain structure; increases tensile strength without affecting analysis, hardness, or machinability of castings; increases fluidity.

Write for Detailed Information

NIAGARA FALLS

Smelting & Refining Division

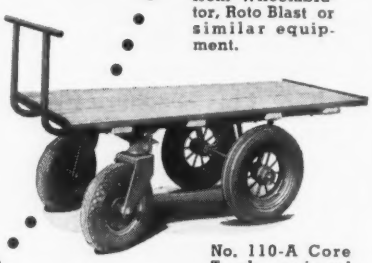
BUFFALO 23, NEW YORK

TRUCKS for Foundries!

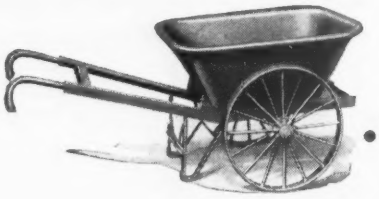
Sterling Heavy Duty Trucks are tailor-made for transporting castings, cores and heavy foundry equipment. Ruggedly constructed for heavy duty service and thoroughly job-tested under actual foundry conditions, Sterling Trucks have proven their ability to handle loads as heavy as 3 tons. Both wheels and casters are equipped with anti-friction bearings. Short turning radius. Easy maneuverability. Write for bulletins.

STERLING WHEELBARROW CO.
MILWAUKEE 14, WIS., U. S. A.

No. 160 Truck to receive castings from Wheelabrator, Roto Blast or similar equipment.



No. 110-A Core Truck equipped with pneumatic-tired wheels and ball bearing swivel casters.



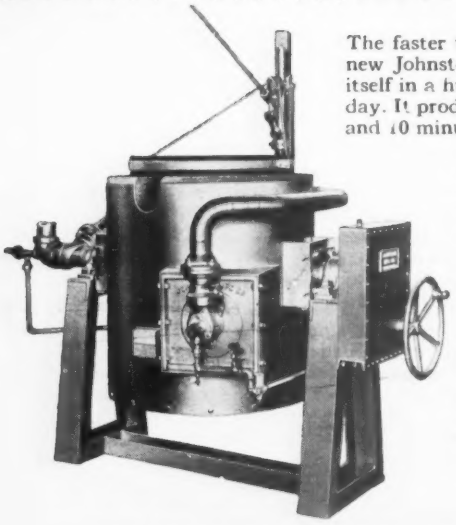
No. 50 Slag Buggy especially designed for conveying slag. Heavy duty, reversible tray. Loose plate for discharge.

Sterling
FOUNDRY EQUIPMENT

A 5633-½R

NEW FURNACE—

Melts 1200 Lbs. of Brass IN 1 Hour, 10 Minutes!



The faster the furnace—the lower your cost. The new Johnston No. 400 Crucible Furnace pays for itself in a hurry by hustling more heats into every day. It produces 1200 lbs. of molten brass in 1 hour and 10 minutes on successive heats, gas fired (may also be oil fired as is model shown). Johnston burners, blowers and experienced engineering combine to produce unusual speed with economically low fuel consumption.

A new enclosed tilting mechanism makes tilting easier than ever before and it may be electrically driven.

Crucible life and lining life are extremely good. Trunions are adjustable for best balance and are supported on large pillow block bearings. A simple, convenient cover lifting mechanism is operated from the front of the furnace.

WRITE FOR CATALOG 223F

OVER THIRTY YEARS EXPERIENCE IN THE DESIGN AND MANUFACTURE OF INDUSTRIAL HEATING EQUIPMENT

THE JOHNSTON LINE — SAFETY — DEPENDABILITY

JOHNSTON MANUFACTURING CO.
2825 EAST HENNEPIN AVE.
MINNEAPOLIS 13, MINN.

ENGINEERS & MANUFACTURERS OF INDUSTRIAL HEATING EQUIPMENT

Phenolic Resin Binders

(*Continued from page* 101)

The usual procedure was to remove a complete set of cores from the desiccator as soon as the original tensile strength and gas determinations had been performed and to place them in an oven operating at 250°F. The cores were allowed to remain there for 30 minutes so that they would be at a temperature of 250°F when tested. They then were removed from the oven one at a time, and immediately tested for strength.

The remaining cores were saved in the desiccator until more batches of cores had been made and tested. At the end of the complete baking cycle, there were enough cores stored in desiccators to determine the percentage loss in strength of the cores at relatively high humidities.

A special, closed oven was used for this test. It was equipped with a mercury thermometer, shelves, a pan which held 1500 cc of water and a relative humidity indicator. Cores were placed on the shelves so that they did not contact each other and were allowed to remain 24 hours. Relative humidity was read on the indicator, and the temperature was noted. From this procedure, by using a psychrometric chart, the grains of moisture could be ascertained.

Relative Humidity Varied

It should be pointed out that it was very difficult to maintain a constant relative humidity throughout these tests. The grains of moisture in the atmosphere are a function of both temperature and relative humidity. On different days, although the oven was closed, there was a variation in relative humidity and temperature. This fact can be noted in Figs. 1, 2, and 3.

Fig. 1 shows that there were 51 grains of moisture in the atmosphere; in Fig. 2, 65 grains; and in Fig. 3, 75 grains. This means that the cores were not subjected to constant moistures. However, it is the author's opinion that temperature as well as humidity affects the reaction of moisture on core binding materials. If this reasoning is correct, since the temperatures recorded were approximately the same, the harmful reaction of the moisture on the binder would have been approximately the same.

A comparison of the results of the original tensile strengths, in Figs. 1, 2, and 3, shows that in all cases phenolic binder A was strongest when the cores were baked for 30 minutes. This was true for all baking temperatures. Test data show that some other binders are stronger when

baked at 400°F than at 350 or 450°F. Since nothing is known about the ingredients in the binders, no reasons can be advanced for these results. Binder D demonstrates this observation to a marked degree because in the 45-minute bake at 400°F, it was strongest of any of the binders tested at that temperature.

Most phenolic binders held their strength quite satisfactorily until after the 75-minute bake. With the 90-minute bake, several had a tendency to lose their strengths. This was more pronounced at the higher baking temperatures, such as 450°F. Two binders, C and E, lost strength more rapidly than the others.

In addition to the above, the results also indicate that each core binder requires an optimum baking time and temperature in order to produce initial maximum tensile strength.

The results of the strength tests on cores reheated at 250°F, Figs. 1, 2, and 3, show that cores made from binder C lost less strength, on the average, than cores made from other binders. However, with the 350°F bake for 30 minutes, binder B showed the best individual performance. Cores made with this binder lost only 4 per cent of their original strength on the reheat at 250°F. Most cores made from phenolic binders lost from 20 to 45 per cent of their original strength on the reheat at 250°F.

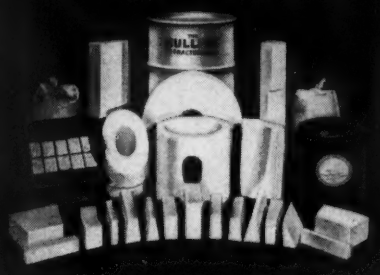
The results seem to point out, in general, that there is an optimum baking time and temperature for each binding material. At this optimum time and temperature, cores lose less of their strength on a reheat at some elevated temperature.

It is the author's opinion that the above test is very important to foundrymen because a large number of cores can be broken when they are

"Pretend you don't notice. We couldn't get a good heat until we recalled him from retirement!"

SHAMVA®

Since 1926 exclusive producers of MULLITE brick, special shapes and specialties



designed for:

HIGHER TEMPERATURE APPLICATIONS

LONGER SERVICE LIFE

for use in:

- Direct & indirect arc furnaces
- Induction furnaces
- Open flame furnaces
- Crucible furnaces
- Cupola spouts & breasts
- Ladles
- Synthetic Mullite grain

SHAMVA Mullite brick, special shapes, ramming mixes and other specialties are engineered to *your* specific needs. Write for SHAMVA field engineering service.

New catalog now available

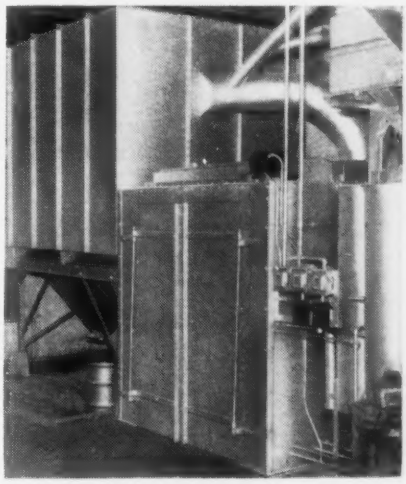
THE MULLITE REFRACTORIES CO.
SHELTON 4, CONNECTICUT

"Tailor-Made"

TO YOUR REQUIREMENTS

MACLEOD

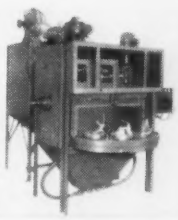
BLAST CLEANING ROOMS



Modern Macleod Blast Cleaning Rooms—designed with the skill and know-how of more than half a century's manufacturing experience—are "tailor-made" to suit the desires of their users. That's why, whatever your specifications or requirements, you can be sure that a Macleod Blast Cleaning Room will fill your needs to your complete satisfaction.

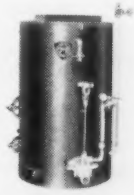
For use with these rooms, Macleod offers a wide selection of Dust Arrestors—in both the screen and filter-tube types. They may be used either as an adjacent (as illustrated above) or outside building installation.

BLAST CLEANING CABINETS



Shown at right is the versatile, new type AL "Rapid-Blast", specifically designed for high rates of continuous production, and especially adaptable to internal cleaning of work. Macleod offers several standard Blast Cleaning Cabinets, such as the "Rapid-Blast," but our Engineering Department will be happy to work with you in designing a special cabinet should your particular requirements demand it.

BLAST CLEANING MACHINES



The Macleod Type "H" Blast Cleaning Machine (at left), available in both portable and stationary models. Along with low cost operation, it features low initial cost and superior blasting efficiency. Macleod offers an extensive line of Blast Cleaning Machines—portable and stationary, for floor level or pit installation, and in semi-automatic and fully-automatic, continuous cycle models.

57 YEARS of SERVICE TO INDUSTRY

The MACLEOD COMPANY
44 Mosteller Road, Sharonville, Ohio
Send this coupon for MACLEOD Bulletins:
☐ No. 600 Rooms ☐ No. 300-A Cabinets
☐ No. 200 Machines

Name _____
Address _____
City _____ Zone ____ State ____

Operators of continuous pour cupolas report CARBOFRAX silicon carbide blocks retain correct hole size, even through long runs. They are completely dependable—your best way to avoid costly slag hole failures. One trial order will show why. For further data, write Dept. V-124, Refractories Division, The Carborundum Company, Perth Amboy, N. J.

Use slag-hole blocks by

CARBORUNDUM

Trade Mark

"Carborundum" and "Carbofrax" are registered trademarks which indicate manufacture by The Carborundum Co.

SEMET-SOLVAY FOUNDRY COKE

"for Better Melting"

This is not just a tricky catch phrase. It's what you get when you use Semet-Solvay Foundry Coke in your cupolas.

What is "better melting"? It's melting your iron *hotter, faster, cleaner.*

SEMET-SOLVAY DIVISION

Allied Chemical & Dye Corporation

CINCINNATI · DETROIT

BUFFALO · CLEVELAND

In Canada: SEMET-SOLVAY COMPANY, LTD., TORONTO

for Better Melting

handled hot. This problem occurs when cores are removed from the core plates.

The results of moisture absorption tests, Figs. 1, 2, and 3, seem to point out that there is no definite trend to the data except that all binders absorb some moisture, which causes a loss in the strength of the cores. Just why some binder seems to be able to resist moisture "pick-up" and thus test stronger after being subjected to some particular heating time and temperature and weaker at other times and temperatures is difficult to understand.

The data show that the phenolic binders tended to be less susceptible to moisture attack if they were heated at 450°F, for at this temperature they lost strength more or less uniformly. Their losses in strength varied from a low of 11.0 per cent for binder E with the 30-minute time to a high of 35 per cent for binder A with the 45-minute time. Considering the results at the lower baking temperatures, 350 and 400°F, it again is difficult to ascertain why the binders gave such nonuniform results. Results indicated that at these lower baking temperatures, moisture attacked most of the binders more severely, resulting in higher losses in strength than at 450°F. However, binders B at 350 and E at 400°F are an exception to this statement.

Studied Gas Evolution

A comparison of the results of the core gas determinations (Figs. 1, 2, and 3) shows that core made with phenolic resin and baked at 350 and 400°F gave off from 31 to 51 cc of core gas when tested at 2500°F. At 450°F all of the phenolic binders gave off a more nearly uniform amount of gas. They all, more or less, gave off from 24 to 39 cc of gas.

Perhaps the most interesting observation of these test data is that each individual binder gave off approximately the same amount of core gas regardless of the length of the baking time at 450°F.

In addition to determining the total amount of gas given off by each binder, the author has included one set of data which shows the rate of gas evolution by each binder. The author plotted one set of data showing the rate at which binders gave off their gas at 2500°F. These results are shown in Fig. 4. Since all the rates on succeeding tests were practically the same, only one set of data is shown.

Binder E gave off its gas very rapidly compared to the others. The total time it required to give off 100 per cent of its gas was 1.5 minutes. All of the remaining binders required

7 minutes. In all cases, however, all binders gave off at least 69 per cent of their total amount of gas in 1.5 minutes.

Summary of Results—The following general observations can be made from the test results:

1. The test results indicate that each binder requires an optimum baking time and temperature to produce maximum original tensile strengths.

2. Cores made from phenolic binders have a good carryover in strength at the temperatures used in this work.

3. The data showed that when cores were baked at various lengths of time, cooled to room temperature and then reheated at 250°F for 30 minutes, they all lost strength. Most of the cores lost from 20 to 47 per cent of their original strengths.

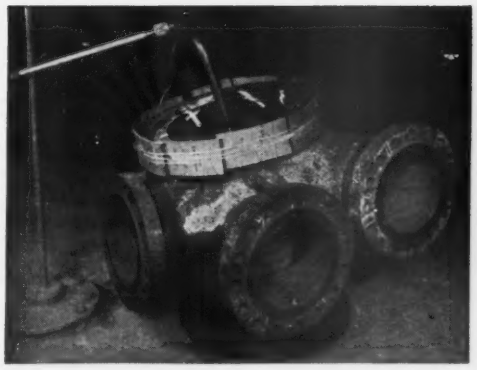
4. Test data showed that when subjected to various relative humidities, all cores made with phenolic binders lost strength. At 350°F, binder E lost the most strength, and binder B lost the least. Considering the various baking times used, binder B gave the best performance.

5. A comparison of the rate at which core gas was evolved showed that most of the binders gave off at least 69 per cent of their gas in 1.5 minutes. Binder E was an exception in that it gave off 100 per cent of its gas in 1.5 minutes. The amount of core gas given off varied from a low of 24 cc in the case of binder E baked for 90 minutes at 450°F to a high of 51 cc in the case of binder B baked for 30 minutes at 350° F.

Acknowledgment—The author wishes to thank the Harry W. Dietert Co., Detroit, for the loan of the gas determinator equipment used in this work and also Dr. Ralph Grim, research professor of geology and consulting clay mineralogist, University of Illinois, for his valuable aid and helpful suggestions in this work.

Safety Films Issued By National Council

New safety films, now available, have been announced by the National Safety Council. How five minutes a day can spell the difference between a good way to live and a harried, unsafe schedule is explained in "Take Time to Live." What would happen to a worker's attitude if his family actually came to the job with him is demonstrated in "If You Took Your Family to Work." These two films run 12 minutes each and are available in 16-mm sound movies and 35-mm sound slide films. Further information is available from the National Safety Council, 425 North Michigan Ave., Chicago 11.



Radiographing a flange on a heavy steel casting.

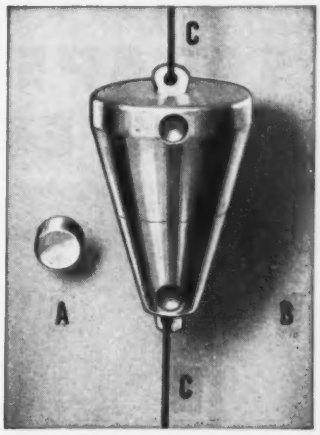
BUY . . . RENT OUR RADIUM . . . OR LEASE RADIOGRAPHY KIT

. . A Short cut to more productive and economical foundry practice

The use of gamma rays in radiographing steel castings has greatly increased since 1930, when the first commercial use of radiography was introduced. Radium radiography is simple, economical and effective; because it may be rented or leased, the equipment doesn't require a capital investment. It is simple to operate because it doesn't require especially skilled operators. Today radium radiography is rapidly approaching the status of standard equipment in progressive steel foundries. Let us tell you more about the simplicity and economy of radium radiography. Write today for prices, terms and case histories. Your requirements promptly supplied.

RADIUM CHEMICAL CO., INC.

161 East 42nd St., N. Y. Chicago: Marshall Field Annex Bldg. Los Angeles: 3974 Wilshire Blvd.



The apparatus is as simple as
A—small radium capsule
B—cartridge container
C—rigid string support

Here's what Industry has to say about REDA melting Furnaces . . .

nothing but praise for the REDA FURNACE . . .

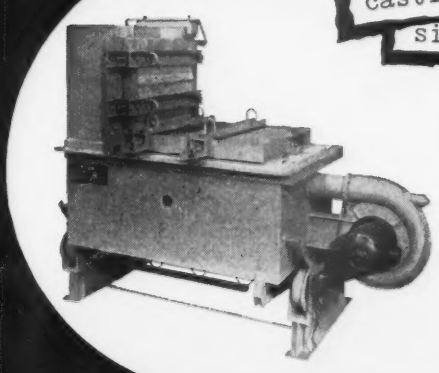
has improved overall foundry operation . . .

doing a wonderful job . . .

much more flexible . . . entirely satisfactory .

castings come cleaner . . .

sincerely recommend it . .



Reda Stack-Loading melting furnaces for ferrous and nonferrous metals have been designed and built by experienced foundrymen for foundrymen everywhere. That is why Reda furnaces provide advantages far beyond those found in other, and more expensive types; that is why, with Reda furnaces there is less down time for maintenance, longer uninterrupted melting runs, and lower melting costs.

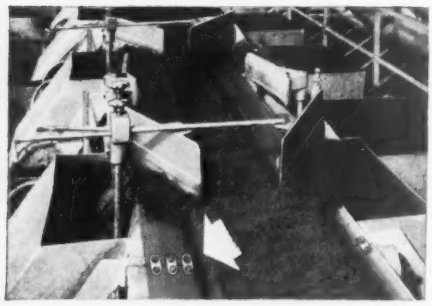
Another feature is the Reda Burner arrangement which can operate from oil and gas simultaneously or be switched from one fuel to the other instantly. *Write or phone for complete details.*

REDA FURNACE

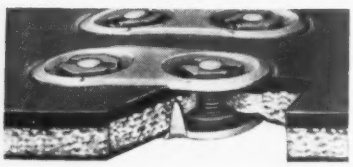
REDA PUMP COMPANY • BARTLESVILLE, OKLA.

NEW!
Developed Especially for FOUNDRIES

FLEXCO SCRAPER PLATES



FOR JOINING CONVEYOR BELTS WHERE SCRAPERS AND PLOWS ARE USED



- Especially designed for use in joining foundry conveyor belts.
- Beveled top plates ride snug to belt eliminating interference with plowing and scraping operations.
- Thoroughly tested . . . by several large foundries . . . for four years.
- One size . . . for joining belts 5/16" to 1/2" thick with not more than 500 ft. centers.
- Available in Steel, Monel and Everdur.

Ask for Bulletin F-108

Order From Your Supply House

FLEXIBLE STEEL LACING CO.

4667 Lexington St., Chicago 44, Ill.

TRADE PUBLICATIONS

For More Details Use Reply Card—Page 209

BONDING MORTAR: Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh 22, Pa.—Two bulletins describing two types of high temperature, cold-setting bonding mortars are available. One has high refractory and nonshrinking characteristics and consists of hard calcined high-alumina minerals and plastic bonding constituents. The other is an all-purpose bonding mortar consisting of finely ground chrome ore, chemical binders and a plasticizer.
For More Details Circle No. 147—Page 209

UNDERFLOOR WIRE SYSTEM: Howard Electric, Division of Howard Foundry Co., 1700 North Kostner Ave., Chicago 39, Ill.—Standardized underfloor wire distribution system is described in an illustrated folder.
For More Details Circle No. 148—Page 209

DUCTILE IRON: International Nickel Co., 67 Wall St., New York 5, N. Y.—Bulletin DI-16 discusses the influence of carbon, silicon and phosphorus and of section size on the mechanical properties of ductile iron.
For More Details Circle No. 149—Page 209

HOOK SCALE: Martin-Decker Corp., 3431 Cherry Ave., Long Beach 7, Calif.—Bulletin M-25 describes a friction-free hydraulic hook scale available in models up to 20,000 lb capacity.
For More Details Circle No. 150—Page 209

HEAT TREAT POTS: American Brake Shoe Co., Electro-Alloys Division, Elyria, O.—Sizes of heat treat pots available are listed in bulletin. Each pot is x-rayed and pressure tested.
For More Details Circle No. 151—Page 209

GRINDING MACHINERY: Lobdell United Co., Subsidiary of United Engineering & Foundry Co., Wilmington 99, Del.—Two bulletins describe floor grinders and abrasive cut-off machines. Specifications are included.
For More Details Circle No. 152—Page 209

DOUBLE END LOADER: Maine Steel Inc., South Portland, Me.—Folder describes a double-end loader which digs in front or rear, but always dumps in front.
For More Details Circle No. 153—Page 209

INDUSTRIAL FURNACES: Eclipse Fuel Engineering Co., Rockford, Ill.—Melting furnaces, forging furnaces, ovens and tank heaters are described in bulletin D.
For More Details Circle No. 154—Page 209

MAGNETS: Ohio Electric Mfg. Co., 5900 Maurice Ave., Cleveland 4, O.—Variety of magnet applications is described in folder.
For More Details Circle No. 155—Page 209

EXPLOSION PROTECTION: Combustion Control Division, Electronics Corp. of America, 718 Beacon St., Boston 15, Mass.—Combustion control system, providing protection

LITHIUM

. . . the Miracle Element

Only 0.005% Makes A Sounder Nonferrous Casting

Lithium has long been established in metallurgy as a degasifier, deoxidizer, desulfurizer and general purifying agent. As a degasifier of Nickel Bronze, Lithium makes possible a dense, fine-grained metal.

A small slug (2¼ grams) of metallic Lithium added to a charge of molten copper or copper alloy eliminates entrapped oxides and gases. Tensile strength and elongation are increased, porosity decreased, and grain size reduced. Characteristic low density causes the lithium products formed to float to the surface where they are easily removed as slag. By adding Lithium the surer way—in the handier *cartridge* form—you eliminate the "by-guess-and-by-gosh" formulation too common with less satisfactory methods.

Lithium Cartridges will give you an improved, more uniform casting with better electrical conductivity, with less trouble and at less cost. The small amounts required put both the economics and technique of Lithium within your reach. Hermetically sealed in copper tubing with easily removed plastic-sealed ends, four sizes—2.25, 4.50, 9.0 and 108.0 grams—are available.

Investigate Lithium Cartridges. Write for details on actual foundry tests.

. . . trends ahead in industrial applications for **LITHIUM**

LITHIUM CORPORATION OF AMERICA, INC.

General Offices:
Suite B, Rand Tower.
Minneapolis 2, Minn.

Plants:
St. Louis Park, Minn. and Bessemer City, North Carolina

Mines:
Black Hills, South Dakota, Bessemer City, North Carolina, Manitoba and Quebec

against explosion hazards of burning fuel, is described in bulletin CF-30. The new system extends to users of light oil, gas and combination burners the instant flame detection and flame failure prevention previously available only with large industrial heavy oil burners.

For More Details Circle No. 156—Page 209

SELF-PRIMING PUMPS: Worthington Corp., Advertising and Sales Promotion Dept., Harrison, N. J.—Graphical explanation of the specifications, applications and sizes of various types of self-priming centrifugal pumps is given in bulletin W-395-B2. The pumps are frame mounted with capacities to 550 gpm, heads to 140 ft and sizes from $1\frac{1}{2}$ to 4 in.

For More Details Circle No. 157—Page 209

PACKING SELECTOR: New York Belting & Packing Co., 1 Market St., Passaic, N. J.—Simplified packing selector, a cardboard disk 6 in. diam, selects the right packing for almost any application in a matter of seconds. Shown on the circular selector are packing styles, pressure and temperature readings for the four types of packing applications, gaskets, valve stems and centrifugal and reciprocating pumps. Selection is based on the type material being handled.

For More Details Circle No. 158—Page 209

REFRACTORY CONCRETE: Universal Atlas Cement Co., Lumnite Division, 100 Park Ave., New York 17, N. Y.—New manual covers basic information on recommended practice for placing and mixing refractory concrete. Charts and tables put important technical data in a convenient form for easy reference.

For More Details Circle No. 159—Page 209

SANDBLAST MACHINES: Leiman Brothers Inc., 146 Christie St., Newark 5, N. J.—Standard cabinet type sandblast machines featuring a new over-size viewing glass giving uncramped full vision are described in bulletin 6224. Information is included on other types of sandblast machines.

For More Details Circle No. 160—Page 209

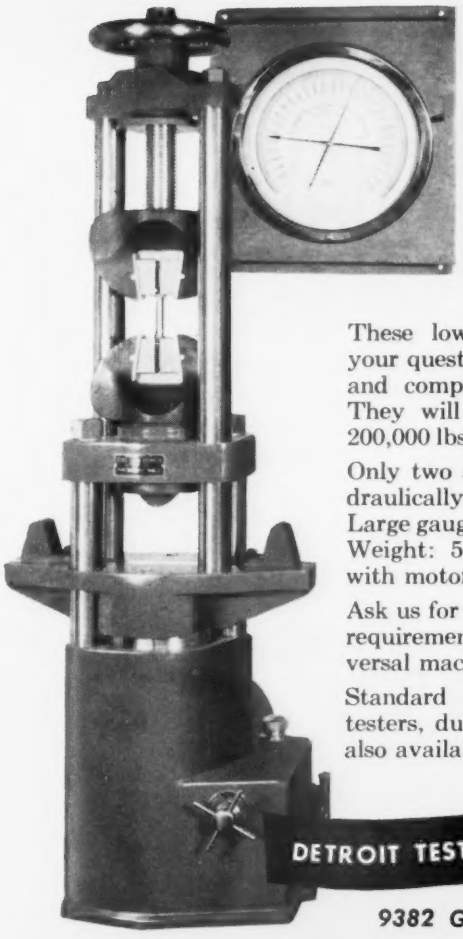
DISC GRINDING: Norton Co., 3 New Bond St., Worcester 6, Mass.—August, 1954 issue of *Grits and Grinds* contains an article on the use of disc grinding in the precision grinding of automotive castings.

For More Details Circle No. 161—Page 209

FANS & BLOWERS: Robinson Ventilating Co., Zelienople, Pa.—Fans, exhausters, blowers and tables of information are covered in bulletin 501.

For More Details Circle No. 162—Page 209

FIRE EXTINGUISHERS: Stop-Fire Inc., 125 Ashland Place, Brooklyn 1, N. Y.—Portable, one-hand op-



30,000 and 40,000 pound

Universal

Testing Machines

These low-cost machines will answer all your questions about the tensile, transverse, and compression strength of metal parts. They will apply up to the equivalent of 200,000 lbs. per sq. inch (on a .505 specimen).

Only two simple controls operate these hydraulically powered, automatic machines. Large gauge gives accurate reading instantly. Weight: 500 lbs., height: 4′-4″. Equipped with motor, gauge, grips, and blocks.

Ask us for more information or send us your requirements for a quotation, as this Universal machine can be modified many ways.

Standard and special Brinnel hardness testers, ductility testers, and tensile testers also available.

DETROIT TESTING MACHINE COMPANY

9382 Grinnell Avenue, Detroit 13, Michigan

Silent Hoist gave you ***KRANE KAR,*** the first modern Mobile Crane . . . Front-Wheel Drive . . . Stability without Stabilizers . . . Lifetime Front Axle . . . Automatic Safety Controls. And now ***Silent Hoist*** gives you **FLUID DRIVE!**

- ✔ **Increases engine clutch life.**
- ✔ **Provides cushioned starting and acceleration.**
- ✔ **Eliminates overload shock damage to drive gears.**
- ✔ **Speeds operation.**
- ✔ **Cuts maintenance drastically.**

Ask for Bulletin No. 79C

"Silent Hoist" *KRANE KAR* Swing-Boom Mobile Crane . . . 1½, 2½, 5, 10, 12½ Ton Capacities

SILENT HOIST & CRANE CO.

Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment

885 63rd Street, Brooklyn 20, N. Y.

ANNOUNCING

Necon Overhead Sand Handling Plant

Britain's finest . . . complete "packaged plant" with elevator, conveyor, two to twelve hopper stations. Fits under low roofs . . . only 13 ft. headroom. Air-operated plows and gates . . . automatic if desired. Excellent heavy construction.

Six-station NECON unit immediate shipment from Stamford, Conn.

$9,700.00 Complete

U. S. Agents:

STAMFORD ENGINEERING WORKS
507 Canal St. Stamford, Conn.

Control Foundry Chilling with

CHILL KOOLHEAD NAILS

CHILL NAILS and SPIDERS

Choose any style chill nail from jumbo to stubby; slim, medium, or horse nail blade, blunt, pointed, straight or 90° bent. Same types available in Stainless, Brass, Aluminum, Copper coated to order. Spider Chills, jumbo or horse nail legs—double or single. Available in various sizes and types; also made to your individual specifications.

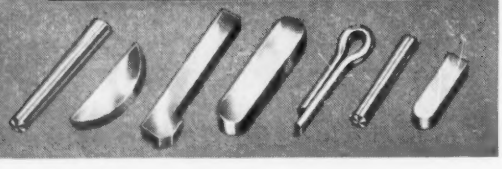
Write for detailed descriptions and prices.

STANDARD HORSE NAIL CORP.
Since 1872 NEW BRIGHTON PA.

Other Products

PINS STEEL Stanho PRODUCTS KEYS

SPECIAL PARTS



erated fire extinguishers of the stored pressure, vaporizing liquid type for use against inflammable liquid and electrical fires are illustrated in bulletin RG-154.

For More Details Circle No. 163—Page 209

PHOTOGRAPHY NOTES: Eastman Kodak Co., Sales Service Division, Rochester 4, N. Y.—Expert opinion from the color, industrial and studio fields has been combined in one publication, *Kodak Professional Notes,* to enable users to achieve professional quality in their work. The publication will introduce new ideas and new products.

For More Details Circle No. 164—Page 209

AIR-POWERED VISES: Van Products Co., 3779 West Twelfth St., Lakewood, Erie, Pa.—Time saving applications of air-powered vises used in production holding and pressing jobs are discussed in a four-page brochure. Illustrations and text tell how the usefulness of these vises is increased by using special jaw faces, distinctive mountings and by using two or more air vises operating in unison from a single foot-controlled valve. It also discusses safety and the elimination of operator fatigue with increased production.

For More Details Circle No. 165—Page 209

TRUCK BATTERY CHARGERS: The Electric & Machine Works, Dept. FYC, 17 South Jefferson St., Chicago 6, Ill.—Four new selenium automatic battery chargers used to charge six-cell batteries are described in bulletin 4520. Charging rates, graphs and circuit diagrams are included.

For More Details Circle No. 166—Page 209

TRACTOR LOADER: Oliver Corp., 400 West Madison St., Chicago 6, Ill.—Crawler tractor with loader, backfiller, bulldozer, lifting boom, lifting fork and snow plow attachments is described in a new bulletin. The loader bucket is of ½ cu yd capacity.

For More Details Circle No. 167—Page 209

CONCRETE FLOORS: Kalman Floor Co., 110 East 42nd St., New York 17, N. Y.—Absorption method of installing heavy-duty concrete floors is described in a 28-page booklet. Each step in the process is illustrated.

For More Details Circle No. 168—Page 209

HYDRAULIC STANDARDS: Miller Fluid Power Co., 2040 North Hawthorne Ave., Melrose Park, Ill.—Hydraulic standards and engineering data sheet are combined with sectioned drawing of hydraulic cylinder for complete description.

For More Details Circle No. 169—Page 209

OPERATING PRACTICES: Johns-Manville, 22 East 40th St., New York 16, N. Y.—Recommendations

for getting the best service out of insulation, packings, refractory products, roofings and friction materials are given in a newly revised booklet.
For More Details Circle No. 170—Page 209

HAND & FOOT VALVES: Ross Operating Valve Co., Dept. 2101, 120 East Golden Gate, Detroit 3, Mich.—Design advancements in hand and foot operated valves are described in bulletin 303-B. Installation data, exploded views and colored flow diagrams are included.
For More Details Circle No. 171—Page 209

INGOT NEWS: R. Lavin & Sons Inc., 3426 South Kedzie Ave., Chicago 23, Ill.—September issue of *The Lavingot* tells of the company's expansion and traces the steps in the production of nonferrous ingots.
For More Details Circle No. 172—Page 209

CASTABLE REFRACTORY: Plibrico Co., 1800 North Kingsbury St., Chicago 14, Ill.—Thirteen grades of self-hardening refractory material packed in a dry form are described in a folder.
For More Details Circle No. 173—Page 209

CRANES: Downs Crane & Hoist Co., 540 West Vernon Ave., Los Angeles 37, Calif.—Bulletin G8 lists cranes, parts, fittings and many types of hooks, tongs, slings and lifters.
For More Details Circle No. 174—Page 209

FOUNDRY reprints

Test Bars for Cast Copper and Aluminum Base Alloys by Robert A. Colton and Donald A. LaVelle discusses test bars and the use of such bars as an indication of casting quality. Suggestions are made for the design of test bar patterns, on producing test bars, pouring practice, heat treatment and testing procedures.
For a Copy Circle No. 175—Page 209

Modern Trends in Molding Machines and Core Blowers by George E. Miller describes strides made in use and design of molding machines and core blowers since World War II. Improvements in patterns and coreboxes, sands, flask equipment, jolt-squeeze-strip machines and automatic controls are covered.
For a Copy Circle No. 176—Page 209

Simple System Provides Rapid Cupola Charging by Edwin Bremer provides a detailed description of a semi-mechanical cupola charging system that is working satisfactorily for a foundry and machine company that produces a wide variety of gray iron castings.
For a Copy Circle No. 177—Page 209

WHEN IT'S MARKED WITH

MARKAL

IT STAYS MARKED!

CONVENIENT, TIME-SAVING!

MARKAL PAINTSTIKS assure against loss of identification. *Marks any surface, wet or dry, rough or slick.*

FOR HOT SURFACE marking: Markal Paintstiks are widely used for marking surfaces up to 2000°F.

FOR COLD SURFACE marking: Markings can be made on cold, icy, rusty, wet, oily or rough surfaces from −30°F to +150°F.

PERMANENT, FADE-PROOF, WEATHER-PROOF!

MARKAL PAINTSTIKS are available in a variety of colors and types.

Samples furnished on request. Just give us the facts!

HOT
200 TO 2000° F.

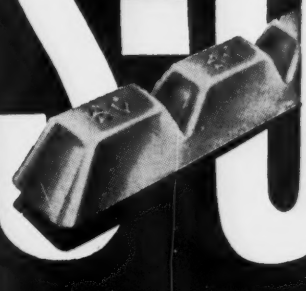
COLD
−50° TO +150° F.

MARKAL
3050 W. CARROLL AVE., CHICAGO 112, ILL.

When You Think of *Aluminum Ingot*
THINK of
S-G

The sign, S-G, on aluminum ingot means aluminum of uniform quality made to meet the most rigid chemical and physical specifications. Whether it's for permanent mold, sand or die cast you can be sure with S-G ingot.

Our complete modern research and testing laboratories are available to help you secure just the right ingot to meet your needs.

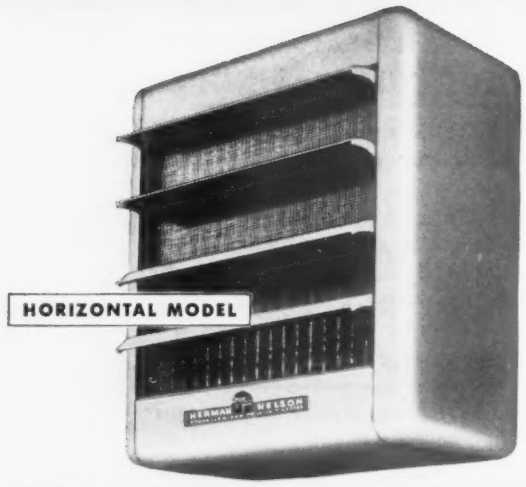


BRASS AND BRONZE INGOT ALSO PRODUCED TO YOUR SPECIFICATIONS

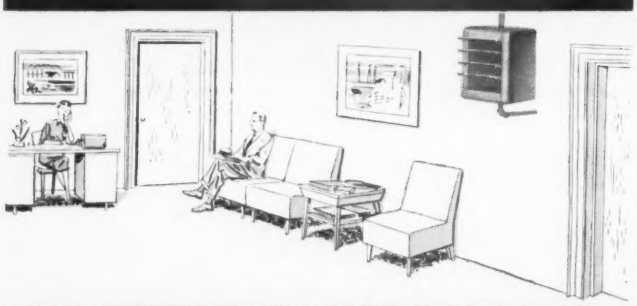
SONKEN-GALAMBA Corporation
MEMBER ALUMINUM RESEARCH INSTITUTE
Riverview at 2nd Street • Kansas City 18, Kansas

job-rated

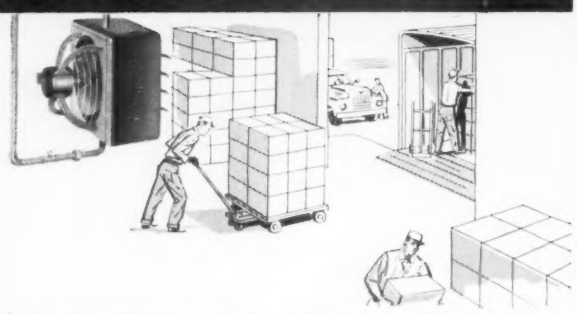
HERMAN NELSON UNIT HEATERS



BEAUTIFUL ENOUGH FOR THE LOBBY



POWERFUL ENOUGH FOR THE LOADING DOCK



Choose the right heater in the right size from the *job-rated* line of Herman Nelson Horizontal Unit Heaters. Eighteen sizes handle every heating need, all are designed to use either steam or hot water. You get quick heat—no warm up to waste fuel and electric current. Get the best—and most beautiful—get Herman Nelson Unit Heaters. Available also in Vertical, Console, Gas Fired and Industrial models.

Write for descriptive literature.

AAF

herman nelson

American Air Filter

COMPANY, INC.

266 Central Avenue, Louisville 8, Ky.

AMERICAN AIR FILTER OF CANADA, LTD.

Montreal, P. Q.

COLOR YOUR CORE SANDS

Modern foundries have found it practical to color their various grades of core sands. This eliminates guesswork and assures the proper use of the required type of core sand for the particular job at hand.

Our laboratories have developed a line of special dyes in a range of colors that have been carefully tested and found suitable as well as economical.

Write us for details and samples.

EATON CHEMICAL AND DYESTUFF COMPANY

1490 Franklin Street — Established in the year 1838 — Detroit 7, Michigan

Canadian Branches: Windsor and Toronto

ANALYSIS OF CASTING DEFECTS

(American Foundrymen's Society Publication)

133 pages, illustrated
Price $4.25 Postpaid

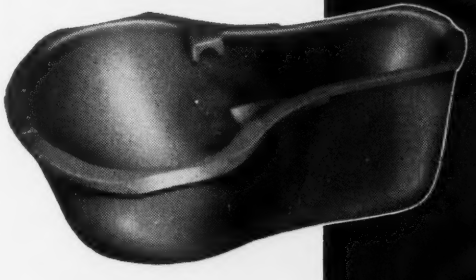
To help foundrymen minimize and eliminate defective castings. Thirty-one basic casting defects are listed and described. Defects are defined simply and completely, illustrated by 101 figures collected from foundries of the United States and Canada.

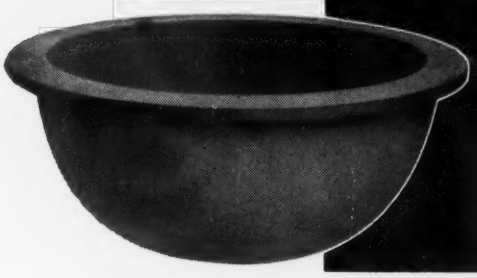
THE PENTON PUBLISHING COMPANY

Book Department

1213 W. 3rd St., Cleveland 13, Ohio

THEY STAND THE HEAT!





Acme

MELTING POTS

DIE CAST POTS

INGOT MOLDS

. . . FOR MELTING NONFERROUS METALS

MADE OF SPECIAL M-HEAT RESISTING IRON

WRITE FOR SCHEDULE OF 40 SIZES

Acme FOUNDRY COMPANY

2502 22nd St. Phone: Tashmoo 5-2404 Detroit 16, Mich.

EMPIRE

"THAT GOOD"

FOUNDRY COKE

DEBARDELEBEN COAL CORPORATION

2201 First Ave., North • Birmingham 3, Ala.

Phone 3-9135

SHORT CUT TO PROFITS

1

Ohio MAGNETS

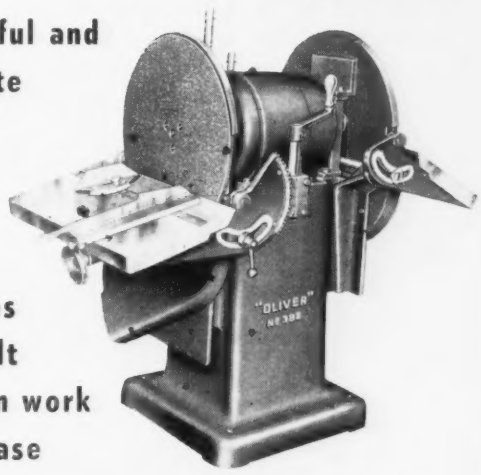
WELDED AND BOLTED TYPES • ALL SIZES • COMPLETE CONTROL EQUIPMENT • 28 YEARS A LEADER IN MAGNETIC MATERIALS HANDLING.

THE OHIO ELECTRIC MFG. CO. • 5400 DUNHAM ROAD • CLEVELAND, O.

Associate Member Institute of Scrap Iron and Steel, Inc. A-9095

"OLIVER" NO. 382-DD 20-INCH DOUBLE DISK SANDER

Powerful and accurate



Handles difficult pattern work with ease

This "Oliver" Sander for pattern shops has two tables 25 x 12 inches. One has 4-inch vertical adjustment, and is fitted with a combination gauge for accurate sanding of segments, circles and duplicating work. Other table is plain and non-adjustable vertically. Both tables tilt as much as 45° down, and 15° up. Easy to adjust and operate. Write for Bulletin No. 382.

OLIVER MACHINERY COMPANY

Established 1890 GRAND RAPIDS 2, MICHIGAN

INCREASE PRODUCTION with the
MURPHY PISTOL SPRAYER

OVER A MILLION IN USE . . .

The Hamilton Spray Gun

$15
1/8" and 1/4" pipe size F.O.B. Hamilton, Ohio

For spraying molds and cores with liquids, for cleaning motors and machinery, for laying dust, spraying hot roofing material, and for many other uses. Instant trigger control. Unit shipped complete with 4½ ft. length of suction hose and sinker. Guaranteed.

A squeeze of the trigger and the Murphy Pistol Sprayer instantly shoots a stream of blackening into inner pockets that could never be reached by old-fashioned brush or swab method. Designed by a foundryman, the Murphy Pistol Sprayer is ideal for cleaning permanent molds—aluminum and other metal, and for sand blasting.

Pipe size	1/16"	1/8"	1/4"	3/8"	1/2"
Price F.O.B. Hamilton, O.	$15.00	$15.00	$15.00	$17.50	$22.00

Prices complete with 5 ft. suction hose

EXTRA LONG NOZZLES FOR 3/8" SIZE

This size Sprayer can be furnished with nozzles up to 48" long for spraying ingot molds and hard to reach places . . . also available with curved nozzles up to 15" long.

Long Nozzle Sprayer $22.00

Write for descriptive literature.

$15
1/16" to 1/4" pipe size
Any length nozzle desired

JAS. A. MURPHY & CO. INC.

1421 HIGH STREET · HAMILTON, OHIO

AFTERCOOLERS
SEPARATORS
STRAINERS
TRAPS
SPRAY GUNS
PISTOL SPRAYERS

LOAD...

with a model 363

BARBER-GREENE PORTABLE CONVEYOR

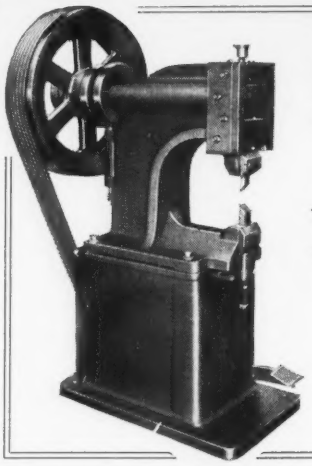
UNLOAD
at lowest cost

with a

BARBER-GREENE model 358 CAR UNLOADER

see your B-G distributor or write

Barber-Greene
AURORA, ILLINOIS, U. S. A.



MILWAUKEE-TESSMER
Sprue Cutter
for Non-Ferrous Metals

- Fast Clipping Action
- Speeds Production
- Lowers Cost

TWO SIZES

H—¾" square, or ⅞" rd. common brass
I—1¼" square, or 1⅜" rd. common brass

Easy and simple to operate. Any workman can operate at top speed. Simple rugged construction for long life and trouble-free operation.

RICE PUMP AND MACHINE CO.
222 Park Ave., Belgium, Wis.

Tamms
AMORPHOUS
CRYSTALLINE
DIATOMACEOUS

SPECIAL SILICAS

SIZE RANGE FROM 100 MESH TO 600 MESH

- All grades of silica ideal for precision casting by the investment molding process
- Will meet the exacting requirements of most precision casting work
- Precision quality to assure uniform casting performance

FINE • PURE • WHITE • UNIFORM

WRITE FOR PRICES AND SAMPLES

TAMMS INDUSTRIES, INC. Dept. RM-12
228 N. La Salle St. Chicago 1, Ill.

No. 4 DAYTON RING VALVE BENCH RAMMER

MORE POWER—MORE SPEED

You'll get more production with these faster, more powerful rammers and at the same time substantially reduce maintenance costs.

The Valve Units will last for years. The Cylinder Bores and Piston Rods are HARD CHROME PLATED which doubles the life of the Rammer. Many of the largest foundries in the country have already adopted them as standard. Made in six sizes to meet every requirement.

Send for Bulletin 300

DAYTON PNEUMATIC TOOL CO.

Manufacturers of Pneumatic Tools Since 1903

DAYTON, OHIO

NEWCOMB-DETROIT

PIONEERS IN ENGINEERING, MANUFACTURING & INSTALLING OF

"Uni-Wash" **DUST COLLECTORS**

Recirculating Water Type —Compact—Efficient—Proven by Foundry Users

●

"Scroll-Aire" **CORE OVENS**

More Air Circulation— Faster Bake and Better Cores

ESTABLISHED 1912

- DETROIT DIVISION
- GRAND RAPIDS DIVISION
- NEWCOMB INDUSTRIES, LTD., WINDSOR DIVISION

For Bulletins and Quotations, Wire, Write or Call—

NEWCOMB-DETROIT

5755 Russell St., Detroit 11, Mich.

TR 3-2100

DESULPHURIZE *ECONOMICALLY*

with

COLUMBIA-SOUTHERN SODA BRIQUETTES

Time and labor are important factors in desulphurizing and cleansing iron as is true in every other Blast Furnace and Foundry operation.

Columbia-Southern Soda Briquettes act fast because their pellet shape, about the size of a walnut, exposes a maximum of surface area for contact with the iron. With fewer manhours required, production can be accelerated while labor costs are actually reduced.

There are no dusting losses with these briquettes. Working conditions are improved and waste is eliminated. They always hit the mark. You can always depend on fast, efficient results.

Order your supply today by name "Columbia-Southern Soda Briquettes." Packed in 100 lb. paper bags, they are easy to handle, easy to store, and easy to transport.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY

ONE GATEWAY CENTER, PITTSBURGH 22, PENNSYLVANIA

District Offices: Boston • Charlotte • Chicago • Cincinnati • Cleveland Dallas • Houston • Minneapolis • New Orleans • New York • Philadelphia Pittsburgh • St. Louis • San Francisco

Problems with Castings?

"GATES AND RISERS FOR CASTINGS"

by Pat Dwyer, Engineering Editor, FOUNDRY magazine

- Recognized sourcebook of information on how to eliminate casting defects.
- Covers virtually all problems that arise in design and use of gates and risers for gray iron, steel, malleable, aluminum and brass-bronze castings.
- Simply written, easy to read text with detailed "how-to-do-it" drawings. This 3rd edition contains 31 chapters, 384 pages, 247 illustrations and is fully cross-indexed.
- Handy source of information which will pay for itself many times in the months and years ahead. Thousands of copies are already doing daily service in every type of foundry.

We invite you to examine "Gates and Risers" free for 10 days and decide for yourself how valuable it can be to you. At the end of that time, send us your check for $6.00, plus a few cents postage—or return the book without obligation. To get your copy just fill in and return the coupon below.

BOOK DEPARTMENT
Penton Publishing Co.
Penton Building
Cleveland 13, Ohio

Please send me a copy of "Gates and Risers for Castings" to examine FREE for 10 days

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

SUCCESSFUL FOUNDRIES EVERYWHERE

ARE SAVING MONEY WITH

SAFCO Core Oils...

★ LOWER CORE AND CASTING LOSSES
★ REDUCE SHAKE-OUT TIME AND LABOR
★ CUT CLEANING ROOM COSTS
★ DECREASE BAKING TIME
★ REDUCE CORE GAS AND SMOKE
★ ELIMINATE CORE-BOX STICKING

Foundries of every type and size are cutting losses and saving money by putting a SAFCO core oil to work for them. In the comprehensive SAFCO line there is the correct oil to fit your foundry practice and give outstanding performance...

WRITE FOR FREE LITERATURE — TODAY!

OIL PIONEERS FOR OVER 100 YEARS

SWAN-FINCH OIL CORPORATION

205 EAST 42nd STREET · NEW YORK 17 N.Y.

BUFFALO · CHICAGO · DETROIT · MEMPHIS

HIGH SILICA QUARTZITE PEBBLES

★ ★ ★

R. W. SIDLEY, INC.

THOMPSON, OHIO TEL. 2701

WELLMAN
Williams Type

INSTANT "ON-AND-OFF" SERVICE ANYWHERE

The Wellman "Hook-on", single-line bucket is designed to provide clamshell bucket service at any crane hook where suitable head room and hoist capacity are available.

Hook the yoke over the crane hook and the bucket is ready for work. When the job is finished, take the yoke off the hook and the crane is free for other duties.

Capacities from ⅜ to 2 cubic yards. Write for free bulletin.

THE WELLMAN ENGINEERING CO. 7044 CENTRAL AVE. CLEVELAND 4, OHIO

CROBAUGH LABORATORIES

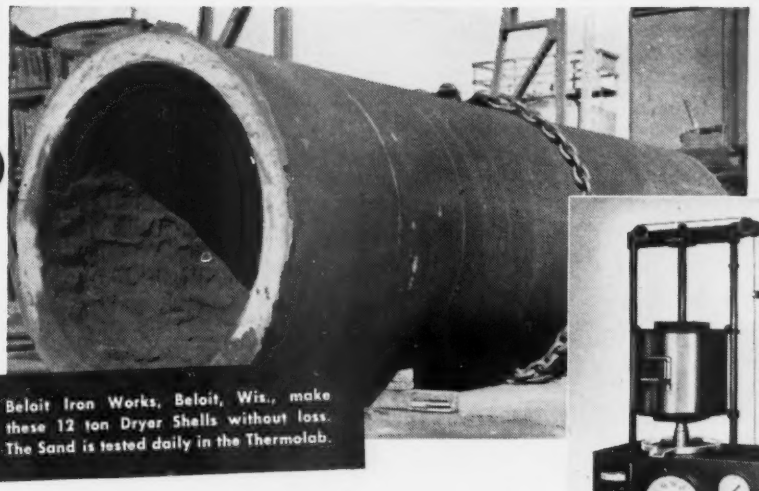
Chemists—Metallurgists

FOUNDRY SERVICE

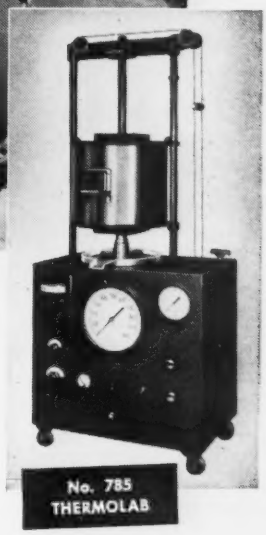
THE FRANK L. CROBAUGH CO.

Phone SUperior 1-4712 CLEVELAND 13, O.

GOOD CASTINGS FROM THERMOLAB TESTED SAND



Beloit Iron Works, Beloit, Wis., make these 12 ton Dryer Shells without loss. The Sand is tested daily in the Thermolab.



No. 785 THERMOLAB

Here is a good way to be sure your important castings will come out of the sand in perfect condition.

The above 5 foot Dryer Shell appears just as it came from the shakeout, clean and free from defects.

Beloit Iron Works consider the Thermolab an essential part of their quality control program. Savings in casting finishing operations alone, paid for the Thermolab in the first six months.

High temperature sand testing and control in the Dietert Thermolabs is the key to high casting quality.

HARRY W. Dietert COMPANY

CONTROL EQUIPMENT
SAND · MOLD · MOISTURE
CARBON · SULFUR

9330 ROSELAWN AVE. • DETROIT 4, MICHIGAN

The Dietert Co. will be glad to explain how a Thermolab can help you.

Write TODAY TO DEPT. A FOR DETAILS

CENTRIFUGALLY CAST

AUTOMOBILE CYLINDER LINERS

DIESEL ENGINE LINERS

BRONZE BUSHINGS

on the new
WATER-COOLED
Model M-WC
(Illustrated)

Utilizes low cost permanent molds of available steel tubing to produce gray machinable cast iron or bronze bushings.

Water cooled molds can be maintained at either high or low temperature easily. High or limited production in very small space with unskilled labor. Completely safe for workmen. Simple, sturdy equipment. Quick changeover from one mold to another. Practically 100% metal yield of high quality, denser castings. Metal porosity eliminated.

Write for new Bulletin # 153 Illustrating Model M-WC

RESEARCH FACILITIES

We have available an Experimental Foundry equipped for ferrous and non-ferrous melting for both vertical and horizontal centrifugal casting production. Our facilities are available to foundries for research or trial centrifugal castings at low cost.

Centrifugal Casting Machine Co.
P. O. Box 947 Tulsa 1, Okla.

Master Power

HARD CHROMED • PORTABLE PNEUMATIC TOOLS

DO MORE WORK AT LESS COST

because they deliver more power per cubic foot of air consumed, are light in weight for easier maneuverability and they retain their new tool power longer.

ARE PREFERRED BY OPERATORS

because they are lighter in weight, better balanced and designed to reduce shock and be free from vibration.

IF YOUR PROBLEM INCLUDES

chipping, ramming, grinding, buffing, sanding or wire brushing, *write us today for full particulars.*

THE MASTER PNEUMATIC TOOL COMPANY, INC.
ORWELL, OHIO • U. S. A.
SALES • SERVICE • STOCK • COAST TO COAST

NOW!!!
CESIUM RADIOGRAPHY SOURCES

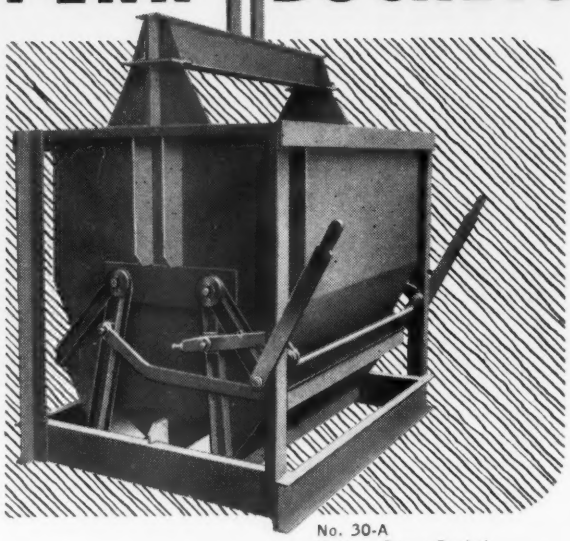
33-Year Half Life...Very Low Cost...Increased Contrast...Lighter and Less Expensive Containers

Tracerlab has reduced prices of its Cesium-137 sources up to 70%, because the AEC has reduced its cost, we are now buying in quantity, and are encapsulating popular sized sources for stock. Cesium is being increasingly used for radiography because of its lower energy radiation (0.60 MEV), which makes it ideal for thin steel sections and less dense metals such as aluminum, because better contrast is obtained. Additional advantages are its long life and the use of lighter shipping containers. 1 Curie source (3/16" x 1/8" active dimensions) only $275.00.

Complete cost and delivery information on request.

Tracerlab
130 HIGH ST., BOSTON
2020 WRIGHT AVE., RICHMOND, CAL.

PENN BUCKETS



No. 30-A
Bottom Dump Bucket

Exclusive design makes this bottom dump bucket easy to operate . . . easy to open. Efficient for foundry use in handling all types of sand, moulding or core, dry or prepared. Can be used with coke, scrap iron and castings also. Sizes 7 to 200 cu. ft.

MEMBER FEMA FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION INC.

Write Today for Catalog • Prices Quoted on Application

PENN IRON WORKS, INC.
READING, PENNA.

34 years of fine pattern making

Danko has the background, the professional skill and the facilities to supply all your pattern needs, large or small. Precision performance and prompt service are routine at Danko. Phone or write today.

• Metal or wood match plates • Cope and Drag Machine Plates • Permanent Molds

DANKO PATTERN & MFG. CO., INC. • BALTIMORE 15 • MO. 4-8930

EF
GAS, OIL AND ELECTRIC
FURNACES
For all annealing and heat treating requirements
THE ELECTRIC FURNACE CO. • SALEM, OHIO
Canadian Associates • CANEFCO LTD. • Toronto I, Canada

COST CONTROL
WESTOVER ENGINEERS
Westover ENGINEERS
FOUNDRY MANAGEMENT CONSULTANTS
3110 WEST FOND DU LAC AVE., MILWAUKEE 10, WIS.
There is no better time than NOW to review incentives, methods, scheduling, production control and paperwork processes.

FOUNDRY
EDWIN S. CARMAN, INC.
LEE ROAD AT MAYFIELD
CLEVELAND 18, OHIO
A COMPLETE FOUNDRY SERVICE
MECHANIZATION

HOW TO USE THE CUPOLA
$1.00 Postpaid
NEW 36 PAGE HANDBOOK
by Bernard P. Mulcahy, Pres. of Fuel Research Lab. Inc.

13 HELPFUL CHAPTERS ON ALL PHASES OF THE CUPOLA. "How To Use The Cupola" . . . . 13 idea-packed chapters based on the practical experience of a man who has devoted his life to foundry fuel and melting problems. It's a mighty useful handbook—a handy source of information which will pay for itself many times over in the months and years ahead.

Book Department
THE PENTON PUBLISHING CO.
1213 W. Third St. Cleveland 13, Ohio

SAND CASTERS using METAL PATTERNS SAVE MOLDS with

IMS SILICONE SPRAY MOLD RELEASE

SAND MOLDERS
PERMANENT MOLDERS

Check These Features:

- This high temperature release keeps sand from adhering—saves molds!
- Wets and adheres to all metal surfaces.
- Will not form carbonaceous deposits.
- Completely stable at all molding temperatures.

PRICES: Silicone Spray
(Delivered)

Sample Can	$2.00
Unbroken Dozen	$18.00
Unbroken Gross	$198.40

INJECTION MOLDERS SUPPLY CO.
3514 LEE ROAD • WYoming 1-1424 • CLEVELAND 20, OHIO

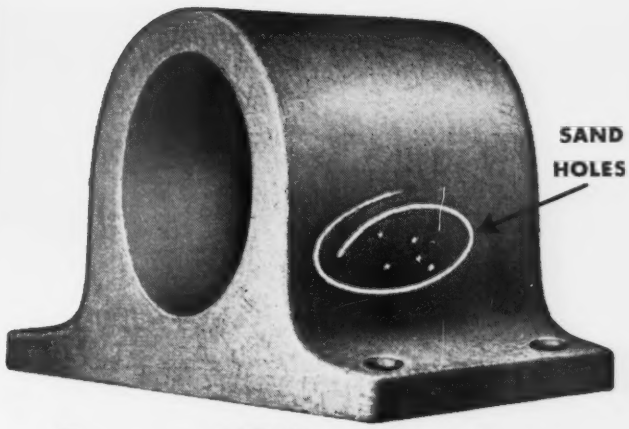
TERRE HAUTE
SPECIAL
FOUNDRY COKE

•

A QUALITY PRODUCT

Sold Exclusively by
REPUBLIC COAL & COKE CO.
8 South Michigan Ave., Chicago 3, Illinois

BRANCHES: Peoria • New York • Indianapolis • Milwaukee • Minneapolis • St. Louis
Detroit • Cleveland • Cincinnati
Manufactured at Terre Haute, Indiana by INDIANA GAS & CHEMICAL CORPORATION



Save This Casting
***with* SMOOTH-ON**
FOUNDRY CEMENTS

Often a perfectly good casting has blow or sand holes, surface blemishes, or rough and porous areas that detract from its appearance. But there's no reason why it can't *look* as good as it really is.

Simply use Smooth-On Foundry Cement. It goes on easily, quickly . . . hardens rapidly at a predictable rate . . . stays firmly in place.

SHADINGS TO MATCH ANY CASTING

4A • Medium Gray
4AA • Light Gray
4B • Dark Gray
8 • Aluminum
9 • Bronze or Brass

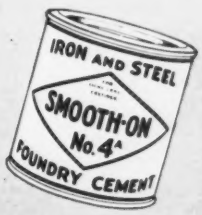
Quality Control That Assures You of Tight, Lasting Repairs

Every lot of Smooth-On Foundry Cement is laboratory tested for setting time, hardness and color. You can be sure of tight, lasting, good looking results every time, provided the directions are followed.

See how much better your castings will look after treatment with Smooth-On, known and used by leading foundries for more than 55 years. Try one or more of these cements at our expense. Write today—on your business letterhead—and we will send you free samples.

SMOOTH-ON MFG. CO., DEPT. 17
570 Communipaw Ave.
Jersey City 4, N. J.

FREE SAMPLES



80-399

SMOOTH-ON
FOUNDRY CEMENTS

CLASSIFIED ADVERTISING

Help Wanted

METALLURGIST

ALLOY STEEL FOUNDRY HAS OPENING FOR YOUNG MAN WITH B.S. DEGREE IN METALLURGY FROM RECOGNIZED ENGINEERING SCHOOL. EXCELLENT OPPORTUNITY FOR INDIVIDUAL HAVING SEVERAL YEARS' EXPERIENCE. POSITION COMPREHENDS SUPERVISION OF MELTING PROCEDURES, SAND CONTROL, HEAT TREATMENT PRACTICES, AND CONSULTATION RELATIVE TO GATING AND RIGGING. MUST ALSO BE QUALIFIED TO CONSULT WITH ENGINEERING DEPARTMENT AND SPECIFY MATERIALS. PROVIDE REFERENCES AND COMPLETE INFORMATION IN FIRST LETTER. LOCATION: CHICAGO AREA.

BOX 398

FOUNDRY **CLEVELAND 13, OHIO**

MOLDING FOREMAN

A Northern Ohio steel foundry requires a molding foreman with experience in slinger operations and producing miscellaneous castings up to four ton.
Apply in writing, stating qualifications and salary expected.

BOX 379

FOUNDRY **CLEVELAND 13, OHIO**

WANTED

Experienced maintenance man with all around foundry background. Small plant Eastern Pennsylvania. Excellent Pay.

BOX 378

FOUNDRY **CLEVELAND 13, OHIO**

WANTED

Foundry Foreman for Night Shift. Must have experience in all operations of a production nonferrous foundry specializing in bronze, located in Eastern Massachusetts.
In reply state full particulars regarding experience, education and salary expected.

BOX 394

FOUNDRY **CLEVELAND 13, OHIO**

FOUNDRY SUPERINTENDENT

Qualified for general nonferrous. Specialty—ornamental plaques, signs, jobbing and limited production. Magnesium experience desirable but not necessary. Exceptional opportunity. State qualifications, salary and willingness to move to Southwest. Address: Box 403, FOUNDRY, Cleveland 13, Ohio.

OPPORTUNITY

For industrious and experienced man for operating a #6 Whiting Cupola melting cast iron and steel scrap. Submit full particulars of experience, references and previous situations in reply. Location in the Cleveland area. Address: Box 390, FOUNDRY, Cleveland 13, Ohio.

FOUNDRY SUPERINTENDENT

Gray iron and steel experience. Must be mechanically minded and aggressive. Location: Chicago area. In reply state age, background and salary expected. Address: Box 396, FOUNDRY, Cleveland 13, Ohio.

FOREMAN

For pressure cast plaster plant situated in Midwest. Must have experience. Excellent opportunity for right man. Give full details. Address: Box 381, FOUNDRY, Cleveland 13, Ohio.

WANTED

Foundry foreman thoroughly experienced in the manufacture of large steel castings. Replies confidential. Address: Box 380, FOUNDRY, Cleveland 13, Ohio.

Help Wanted

Positions Wanted

MANAGER OR SUPERINTENDENT

Thirty-five years' practical experience in foundry, molder eighteen years. Have been foreman, superintendent and general manager. Did consultation work in various foundries. One was losing $7,000 per month when I started, in seven months it was making good money. Ran three largest foundries in St. Louis, largest one in Chicago. Understand gray iron, semi-steel, brass, aluminum. Know how to rig jobs to get best production at lowest cost. Understand running of cupola mix of various metals; estimating jobs from blueprints. Can give best of references. Available immediately. Address: Box 382, FOUNDRY, Cleveland 13, Ohio.

SUPERINTENDENT OF MAINTENANCE

Thirty-eight years old, technical schooling. Desire position with mechanized foundry. Experienced in preventive maintenance having reduced costs and increased production. Good labor relations. Twelve years' supervisory experience. Address: Box 330, FOUNDRY, Cleveland 13, Ohio.

EXECUTIVE

Experienced in all phases of foundry operation and management with thorough knowledge of each shop process, engineering, metallurgy, cost estimating and accounting, sales and industrial relations. Technical graduate. Excellent recommendations. Address: Box 366, FOUNDRY, Cleveland 13, Ohio.

FOREMAN — WOOD PATTERNMAKING OR PURCHASING PATTERNS AND CASTINGS, EXPEDITING AND COORDINATING.

Years of experience in the medium to heavy machine tool industry. Iron and steel foundry background. Address: Box 365, FOUNDRY, Cleveland 13, Ohio.

GENERAL MANAGER

Mature, profit-minded, aggressive. Successfully managed five companies—three taken out of the red. Trained two successors, both made good. Qualified to carry complete administrative responsibility and develop all profitable possibilities. Excellent experience foundry, machinery and related lines. Address: Box 393, FOUNDRY, Cleveland 13, Ohio.

CASTING OR FOUNDRY ENGINEER

Young, ambitious engineering graduate with good knowledge of foundry operations. Experience includes shellmolding, squeezer work, melting, casting, sales, research and development. Address: Box 402, FOUNDRY, Cleveland 13, Ohio.

STANDARDS ENGINEER

Nine years in time study, routing, cost estimating and methods work with experience in cost control, labor relations and job evaluation. Age 31. Presently employed as head of department. Address: Box 389, FOUNDRY, Cleveland 13, Ohio.

GRAY IRON FOUNDRYMAN

Available, capable, qualified and experienced to direct all phases of foundry activities. Light to medium heavy work. Seven years' experience. Journeyman. Mechanical engineer graduate. Married. Age 31. Will go anywhere. Address: Box 395, FOUNDRY, Cleveland 13, Ohio.

Positions Wanted

FOUNDRY EXECUTIVE

Thoroughly experienced in the management of gray iron production or jobbing foundries. Qualified to show you a highly efficient and low cost operation. If you are interested. Address: Box 367, FOUNDRY, Cleveland 13, Ohio.

MELTING SUPERINTENDENT

Twenty-five years' experience in production metallurgy of melting of steel, stainless, nodular irons, etc., in electric arc and induction furnaces. Production control of chemical elements for specification metals. Address: Box 359, FOUNDRY, Cleveland 13, Ohio.

SUPERINTENDENT OR GENERAL FOREMAN

Practical foundryman, twenty-eight years' experience in gray iron and nonferrous, jobbing and production shops. Fifteen years on supervision, well versed in all departments. Available immediately. Good references. Address: Box 338, FOUNDRY, Cleveland 13, Ohio.

INDUSTRIAL ENGINEER

Eighteen years in large foundry; eight years in charge of timestudy. Responsible for development and use of standard times on all forms of molding, coremaking, and grinding. Cost and method conscious. University graduate. Age 36. Married. Address: Box 401, FOUNDRY, Cleveland 13, Ohio.

CASTING SALESMAN

Twenty years' experience in sales of nonferrous castings. Capable foundry engineer with ability to diagnose casting problems. Prefer Ohio and adjacent territory. Address: Box 399, FOUNDRY, Cleveland 13, Ohio.

PATTERN CHECKER AND TROUBLE SHOOTER FOR CUSTOMER CONTACT

Experienced all phases of iron and steel foundry operation. Address: Box 383, FOUNDRY, Cleveland 13, Ohio.

WEIGHT ESTIMATING

Estimating of casting weights furnished by return mail. Accurate, reliable and confidential service. Automatic calculator equipment. Nominal fee. Send blueprints to: CHARLES E. ROLAND, ITASCA, ILLINOIS.

LIAISON FOUNDRY ENGINEER

Until recently employed as liaison engineer between large aircraft producer and various foundries supplying castings. Fully experienced in pattern work, engineering, inspection, machining operations, fixturing and all phases of machining and foundry operations. Available immediately. Address: Box 400, FOUNDRY, Cleveland 13, Ohio.

FOREMAN STEEL FOUNDRY

Young man, 12 years' experience (mostly floor molding), with journeyman's papers. Have specialized in molding departments and desire experience as a foreman. Married, age 30, willing to relocate. Address: Box 391, FOUNDRY, Cleveland 13, Ohio.

GENERAL FOREMAN OR SUPERINTENDENT

Twenty years' experience in all phases of iron and steel, including rigging new patterns. Jobbing and production work. Administrative ability and production minded. Address: Box 386, FOUNDRY, Cleveland 13, Ohio.

LABORATORY POSITION WANTED

By a practical core maker to develop core oils. Expert in the development of core oils and sand binders. Address: Box 384, FOUNDRY, Cleveland 13, Ohio.

Representatives Available

MANUFACTURERS' AGENT OR SALES REPRESENTATIVE

Metallurgical engineer familiar with all phases of foundry and metalworking industries is seeking connection as manufacturers' agent or sales representative in Milwaukee area. Address: Box 376, FOUNDRY, Cleveland 13, Ohio.

CLASSIFIED ADVERTISING

Employment Service

FOUNDRY PERSONNEL SPECIALISTS
National Placement and Procurement of

GENERAL AND PLANT MANAGERS, PLANT SUPERINTENDENTS, FOREMEN—ALL DEPARTMENTS, METALLURGISTS, ENGINEERS, CONTROLLERS, ACCOUNTANTS, SALESMEN, SALES MANAGERS, PERSONNEL DIRECTORS, PURCHASING AGENTS.

Confidential Inquiries Invited
From Employers and Qualified Applicants.

For Fast Competent Assistance Contact

JOHN COPE, DIRECTOR — **37 S. WABASH, CHICAGO 3, ILL.**
IMPERIAL PERSONNEL — **FRANKLIN 2-4233**

Representatives Wanted

WANTED

SALES REPRESENTATIVE

We desire to arrange for permanent sales representation. Gray Iron Foundry and Machine Shop facilities; well equipped, low overhead and efficient operation.

BILLARD MACHINE & TOOL CO.
MANSFIELD, PA.

PHONE: COVINGTON 2811

REPRESENTATIVES WANTED

A manufacturer of nationally known foundry equipment has territories available in New England, Western New York and New York City-Newark area. Prefer established company presently handling equipment with engineering-minded personnel.

BOX 397
FOUNDRY — **CLEVELAND 13, OHIO**

SALARIED REPRESENTATIVE

Resident of New England to establish and handle volume accounts in New England territory for malleable iron castings. Give complete resume including salary desired.

BOX 354
FOUNDRY — **CLEVELAND 13, OHIO**

SALES REPRESENTATIVES

Resident men to handle volume accounts for mechanized malleable iron foundry on a commission basis. Territories available in New York State, Western Pennsylvania and Southeastern Seaboard states. Write complete personal and sales data.

BOX 388
FOUNDRY — **CLEVELAND 13, OHIO**

MANUFACTURERS' REPRESENTATIVES WANTED

To sell quality alloy hand and pneumatic forged chipping chisels and closely related items. Commission basis. Open territories available. No stock necessary. State particulars. Address: Box 385, FOUNDRY, Cleveland 13, Ohio.

Wanted-To-Buy

FOUNDRY WANTED

Philadelphia or vicinity. Will buy outright or trade five story income property in center city Philadelphia. ADDRESS: **FERRY MANUFACTURING CO., 126 NORTH THIRD STREET, PHILADELPHIA 6, PA., LOMBARD 3-1122.**

WANTED

Beardsley & Piper Muller No. 50 or No. 60, Skip Hoist and Motors. Must be in first class operating condition. Address: Box 387, FOUNDRY, Cleveland 13, Ohio.

Wanted-To-Buy

MIXERS WANTED

Used Simpson Intensive Sand Mixers. State size, condition and lowest cash price or immediate acceptance. Address Box 578, FOUNDRY, Cleveland 13, Ohio.

MACHINERY WANTED

Induction Furnaces, Screens, Simpson Mixers, Riehle Compression Testing Machines, Pulverizers, Grinders, Conveyors. Address: CONDENSER SERVICE & ENGINEERING CO., INC., HOBOKEN, NEW JERSEY, BA 7-0600.

WANTED

Large cupola blower motor charger. Address: WESTERN FOUNDRY COMPANY, TYLER, TEXAS.

WANTED TO BUY OR LEASE

Small equipped ferrous foundry. Location: Middle Western States. Address: Box 392, FOUNDRY, Cleveland 13, Ohio.

Foundries For Sale

FOUNDRY FOR SALE

GRAY IRON foundry, 44,000 sq. ft. pouring 8 tons per day. All squeezer work. Can produce castings up to 1 ton. Located in Eastern rural area serving two large cities. Price $35,000, part cash.

EDWARD H. ZOLL
FOUNDRIES SOLD AND LEASED
790 BROAD STREET
NEWARK 2, NEW JERSEY

FOUNDRY

Building 20,000 square feet. Adjacent lot. On Railroad siding. Equipped for going business. Employed 45. Located in farm implement area.

OLIVE W. BENSON, REALTOR
TALCOTT BUILDING
ROCKFORD, ILLINOIS

FOR SALE OR LEASE

Well equipped brass and aluminum foundry in central Indiana. Now operating. With living quarters. Address: Box 327, FOUNDRY, Cleveland 13, Ohio.

FOR SALE

Brick and steel foundry, Southern Illinois, 160 x 320 feet, overhead monorail, water transportation available. Ideal for mechanized operation, contains equipment. Address: Box 326, FOUNDRY, Cleveland 13, Ohio.

FOUNDRY—MACHINE SHOP
MARION, OHIO

For Sale: a complete manufacturing unit fully equipped with conventional sand foundry, large range of patterns, plus broach, lathes, and tools for making finish machined bronze bushings and bearings. 14,000 sq. ft. under roof on 1.9 acres. Available for immediate occupancy.

MAGNOLIA METAL CO.
18 WEST JERSEY STREET
ELIZABETH 4, NEW JERSEY
EL. 2-7895

For Sale

FOR SALE

1—Whiting Monorail Charger—3 ton cap.; cab operated crane, complete with all electrical controls; serial #6000; 80' of track and track column supports; hook lift height—35'; 70' per min.; 10 HP motor on hoist; 1 HP motor on trolley—100' per min; crane manufactured in 1948; complete with 5 scrap buckets; wishbone charger.

JOCELYN IRON & STEEL CORP.
2847 SOUTH KEDZIE AVENUE
CHICAGO 23, ILLINOIS

FOR SALE

1—Tinius Olsen 100,000# Universal Compression Testing Machine
1—Magnaflux Demagnetizing Unit
Simpson Sand Mixers 18" dia. Laboratory #0, #1, #1½, #2, #3
Miscellaneous: Screens, Pulverizers, Grinders, Conveyors—all types, Tyler Rotap Screens, etc.
OUR 37TH YEAR

CONSOLIDATED PRODUCTS CO., INC.
66 BLOOMFIELD STREET
HOBOKEN, NEW JERSEY
HO 3-4425 — **N.Y. TEL. BA 7-0600**

FOR SALE

1—Sly 48" x 96" Tumbling Mill
1—Sly 72" x 120" Tumbling Mill
Equipment in good condition and available with or without driving gears, pinions and D.C. motors.

FLORENCE PIPE FOUNDRY AND MACHINE COMPANY
1072 PUBLIC LEDGER BUILDING
PHILADELPHIA 5, PA.

FOR SALE

MOLD CONVEYOR—Link-Belt Horizontal Plane "Car Type". 152'-3" centers terminating by 4'-6" radius bends at each end with automatic Link-Belt #PD 156 Vibrating Shake Out Screen. G.E. 5 HP Motor, 1800 RPM Type "K," Frame #254, TEFC enclosure, 440 V, 3 ph., 60 cy.

BLAST CLEANING BARREL—Pangborn #14 Type GK-2, converted to GK-5. Equipped with #14 Type "FN" Vertical Tilting Loader and #12 Style "C" abrasive reclaimer.

INDUSTRIAL SUPPLIES CO.
330 NORTH SEVENTH ST.
STEUBENVILLE, OHIO

FOR SALE

One International Rollover Draw Molding Machine—27 x 12 draw. Long model Type F. Table size 24" x 72". Serial No. 32139. Turn over capacity 2500 lbs. Good condition. Price $1200.00 F.O.B. Palmyra, New Jersey. Address: **PALMYRA FOUNDRY CO., ARCH STREET STATION, PALMYRA, NEW JERSEY.**

FURNACES FOR SALE

Ten used heat treating furnaces and two 7-ton gantry cranes. Good condition, priced to sell. Address: BAER STEEL PRODUCTS, INC., BOX 1428, BOISE, IDAHO.

FOR SALE

Core Blower—Demmler #1, Ser. 1595; Simpson #1 muller. Address: McKINLEY METAL, BOX 4501, FORT WORTH 6, TEXAS.

For Sale | For Sale | For Sale

FOUNDRY EQUIPMENT

FOR SALE

DISMANTLING PRODUCTION GRAY IRON FOUNDRY.

OFFERING OLD AND RECENT WELL-MAINTAINED EQUIPMENT AT REASONABLE PRICES. CAN BE INSPECTED AT NEWTON, IOWA.

LIST WILL BE FURNISHED ON REQUEST.

PURCHASING DEPARTMENT

MAYTAG COMPANY

NEWTON, IOWA

FOR SALE

QUADRUPLE HEAD TAPPING MACHINE—4 in row, automatic—complete with motors, etc. For tapping & threading small ells, tees, etc.
60 MATCH PLATES—for 1, 1½, 2" ells, tees, etc. which can be tapped by this machine.
9 TAPPING MACHINES—for 2" to 6" taps complete with motors, automatic controls, etc.
1 BLOWER—with electric motor—for #9 cupola.
This equipment is part of Munro-Van Helms Foundry. We bought all patterns and machine shop equipment and are selling these particular items as we do not intend to specialize in them.
This material will be sold for 30% of its value within next 30 days.

PEERLESS PIPE & FOUNDRY CO., INC.
ANNISTON, ALA.

PHONE:
AD 5-2221 or AD 6-0311

MACHINERY FOR SALE

One Simplicity Gyrating Screen Shakeout Machine, Model D, size 5 feet by 8 feet, floor area 15 feet by 20 feet—with 3 phase, 25 cycle, 440 volt operating motors. Reason for selling—too small for our use. In use now and available after January 1, 1955.

GARDNER-DENVER COMPANY
QUINCY, ILLINOIS

CUPOLA

Morris Steel Products Company Cupola, 90" I.D. shell, 40' from bottom of crucible to top of stack, equipped with vertical skip hoist charging unit, with 3000# charging bucket, electric hoist and magnetic brake, mixing ladle 5' length x 4' dia. Complete with Ingersoll-Rand type FS-564-13000 CFM, driven by 150 HP 440 V, 3 Ph., 60 Cy. motor. THIS CUPOLA WAS NEVER USED, NEVER HAVING BEEN ERECTED. ORIGINALLY BUILT IN 1948.

INDUSTRIAL SUPPLIES COMPANY
324 NORTH SEVENTH STREET
STEUBENVILLE, OHIO

FOR SALE

DETROIT ELECTRIC FURNACE

Type AA of 1,200 lb cold metal or 2,600 lb hot metal capacity, complete with mechanical and electrical equipment for melting and rocking, including oil filled transformer of 11,000 v. primary and 125 v. secondary. Presently crated but available for inspection on 48 hours notice. Ideal for high test cast irons, brasses or bronzes. Price: $9,500.00. Address: HOPE ELECTRICAL PRODUCTS CO., 338 WILSON AVENUE, NEWARK 5, N. J.

FOR SALE

1—Used Ruemelin AAG.T Cabinet Type 60" x 30" Hand Sandblast.
1—Used Class ER1 #30832—7 x 6 Ingersoll Rand Air Compressor with motor/starter—15 HP, 3 phase, 60 cycle, 220 volt, 900 RPM.

WOODMANSE MFG. CO.
210 E. MAIN ST. FREEPORT, ILLINOIS
PHONE: STATE 888

FOR SALE

39—Osborn Model 2047-3 Jolt Roll Over Draw Molding Machines. Never used—many in original cases. Replacement cost $10,000. Special price for quick disposal—$950.00 each.

BOX 377
FOUNDRY CLEVELAND 13, OHIO

BUY—TRADE—SELL

48 x 42 WEELABRATOR TUMBLAST	**$1,500.00**
36 x 42 Wheelabrator (Iron Belt)	2,950.00
#2 Wheelabrator Multi Table 8' diam.	3,500.00
Pangborn 6' Air Table	650.00
4' & 8' Pangborn Roto-table	2,500.00
Pangborn 1 cubic ft Air Barrell	350.00
Pangborn Vapor Blast good condition	750.00

ALSO

Roto-Clone dust collectors, American Dust collectors various sizes, pressure tanks, hand cabinets, blowers, motors, etc., all types and sizes.
If you are interested in trading any of the above for your present equipment—Please call or write.

DIAMOND SAND BLAST INC.
5654 WEST JEFFERSON AVE.
DETROIT 9, MICHIGAN
PHONE VINEWOOD 3-6750

FOR SALE

Pattern equipment to manufacture Minneapolis type curb service box. Ideal item for small foundry, can be sold to all municipal water and gas departments. Address: KELLER IRON WORKS, MESHKORO, WISCONSIN.

SMALL GRAY IRON CASTINGS
FOR SALE

Castings up to 300 lbs. Write or Phone: OREGON CASTINGS COMPANY, LITITZ, PENNSYLVANIA, PHONE: 6-2462.

FOR SALE

MOLDING MACHINES
1—Herman, Jolt, Rollover Draw, 6000#, 40" x 60" table.
1—Herman, Jolt Stripper, 48" x 54" table.
2—International, Jolt, Rollover Draw, 24" x 10G, Stationary.
2—International, Jolt, Rollover Draw, 20" x 8-G, Portable.
1—Plain jolt machine, 60" x 72" table, 16" cylinder.
1—#276 PJ Osborn jolt squeezer.
2—No. 275 Osborn jolt squeezers.
2—SPO #611B Stationary Oscillating Jolt Squeeze Strippers.
1—#610 Johnston & Jennings Air Jolt Rollover Draw Portable 24 x 30 table.
1—Tabor 36 x 50 table Air Jolt Rollover Draw, 3000# capacity.

CORE OVENS
1—Coleman Recirculating 3 section with 5 drawers per section.
1—Cole Recirculating 4 section with 5 drawers per section.

BLOWERS FOR CUPOLAS AND FURNACES
1—Connersville Rotary Blower, 3500 CFM.
2—15 HP Spencer-Turbine 2250 CFM at 16 oz.
2—#7½ Roots rotary blowers—27 x 81—14000 CFM.
1—Connersville rotary blower 22 x 66 45 cu. ft. per revolution 9000 CFM.
Maxon-Premix Blowers for Gas ¼ to 1 HP.
2—5 HP 20-oz. Spencer Turbine Blowers.
2—2 HP 20-oz. Spencer Turbine Blowers.

METAL MELTING EQUIPMENT
1—1000# open flame brass melting furnace, gas fired.
1—MNP Fisher Tilting Al. Furnace 600# cap. gas fired.
1—550# Reda Furnace, nonferrous or iron—oil or gas.
1—Hausfeld Stationary Brass, oil or gas burner, 200# cap.
1—Hausfeld Tilting crucible, gas, 250# Al. Cap.
1—Hausfeld 2000# aluminum capacity furnace, barrel type, open flame, oil fired.
New 32" to 41" dia. shell cupolas made to order.
New 1000 lb, aluminum cap. tilting crucible furnaces to specifications.

MISCELLANEOUS
1—Pangborn Rotoblast, 14' dia. table with five 5' tables complete.
1—Pangborn 1 to 4 nozzle air blast generator, complete.
1—American Dust Tube Collector, 30 HP blower, 12000 CFM.
1—Sullivan, 2 stage compressor, 14-8¾ x 10, 75 HP.
500 ft. of 10" Roller Conveyor. Rolls 2½", centers 4".
1—15 HP Gardner Denver air cooled compressor unit.
1—Stoney crane type shakeout.
1—NC-4 Royer sand separator.
1—#1 Demmler core blower.
1—#16 Roto-clone unit complete.
1—McLeod Small Sand Blast Barrel 24 x 24.
1—McLeod Sand Blast Barrel 30 x 30.
1—30 x 48 tumbling mill.
1—36 x 48 tumbling mill.
Complete stock of rebuilt mill and dust exhaust blowers.

CLIFTON MACHINERY COMPANY
1023 W. SIXTH ST. CINCINNATI 3, OHIO

FOR SALE

CUPOLA FURNACE—48" Dia. x 30" high—2 ton capacity, good condition, recently relined, complete with #6 Sturtevant blower, 20 HP motor and V-belt drive, extra firebrick.
LADLE—36" side geared, hand wheel operated, 2 ton capacity, with crane yoke—used 7 times.
BOILER—U. S. Radiator No. C-18, 15 PSI, 25 HP Sectional steam boiler with stoker and controls, excellent condition.
MISC.—Sand mixer, barrel tumblers, blowers, core oven, flasks.

DOVER CHEMICAL CORPORATION
DOVER, OHIO
PHONE 64622

CLASSIFIED ADVERTISING

For Sale

FOR SALE

Complete Semi-Mechanized Foundry Unit

Due to a complete changeover in our operations and methods as producers of Fine Gray Iron Castings, we have available and for sale a Complete Semi Mechanized Foundry Molding Unit, consisting of all necessary equipment from sand conditioning to casting shake out and sorting belt. This equipment is capable of handling 65 tons of sand per hour and 60 tons of poured castings per an 8 hour shift.

This Foundry Unit may be inspected in operation until about Dec. 1 and under power until the latter part of Dec.

We desire to dispose of the above equipment as a package proposition on an, "As Is, Where It Is Basis", but will consider inquiries with regards to single pieces of equipment.

DEALERS WELCOME

Central Specialty Division of

KING SEELEY CORP.

721 NORRIS ST.
YPSILANTI, MICH.

FOR SALE

American Wheelabrator Tablast #3 with 4-48" tables electric controls, dust collector, complete $4250.00
Beardsley & Piper, #40 Speed Muller... $1500.00
Beardsley & Piper Screenarator $300.00
Portable Royer Sanditioner, junior type.. $125.00
Portable Royer Sanditioner, large type... $175.00
25—SPO 110J Jolt Squeeze $225.00
25—Osborn Molding Machines, Jolt Rollover, table 18" x 24", draw 8½", No. 2047-4 ..... $350.00
25—Tabor Molding Machines, 10" squeeze. $110.00
Adams Molding Machine, hand squeeze 34" $65.00
8—Pangborn 224CD3 Dust Collectors, 1695 CFM $500.00
American Dustube #65 with blower and motor $650.00
American Dustube #A35 ..... $450.00
Pangborn EN2 Cabinet with Dust Collector $500.00
Flasks, 12" x 16" $7.00
Skip Hoist Loaders $300.00
Hardness Testers Magnaflux inspection machines
Whiting Gear Ladles $50.00
Riddle, gyro $85.00

M. ELSTEIN
422-426 GRAND STREET
JERSEY CITY, NEW JERSEY

FOR SALE

60—4 wheel metal box trucks with sides 38" x 69" opening ..... $35.00 ea.

21—"V" type foundry dump carts, 1 yard capacity ..... $50.00 ea.

2—North American Blowers, Model #1-488 AC motors.

1—Sturtevant #9 Blower, positive pressure 75 HP, AC motor, 690 RPM.

JOCELYN IRON & STEEL CORP.
2847 SOUTH KEDZIE AVENUE
CHICAGO 23, ILLINOIS

FOR SALE

TURBO BLOWERS WITH MOTORS

CFM	PRESS.	MAKE	CFM	PRESS.	MAKE
6000	32 oz.	Ing.-Rand	660	20 oz.	A-B
4700	32 oz.	Ing.-Rand	500	10 oz.	No.Am.
4050	16 oz.	No. Am.	400	4.3 oz.	Spencer
3500	40 oz.	Spencer	340	20 oz.	A-B
2800	1 oz.	Spencer	320	12 oz.	Spencer
2700	16 oz.	Spencer	180	15 oz.	Spencer
2500	7 oz.	Sturt.	9000	6" SP	Northern
2000	2½ oz.	Spencer	2500	½" SP	American
2000	1 oz.	Spencer	2344	2" SP	Clarage
1150	20 oz.	No.Am.	1100	4½" SP	Bayley
675	16 oz.	No.Am.			

THE MOTOR REPAIR & MFG. CO.
1552 HAMILTON AVE.
CLEVELAND 14, OHIO

FURNACES—BARGAIN

3000# Aluminum Fisher Hydraulic Tilting type.
3000# Aluminum Stroman Hydraulic Tilting type.
Dielectric Core Ovens—Model 900A and 1800A Conveyor type—1949; will set up in your shop.
Osborn Core Blowers—Models 91, 94, and 193.
Herman Jar Rollover & Pattern Draw; 1944; 48" x 144"; 10,000# Series.
Int'l. JDP Pattern Draw; 600# Cap. 8" draw.
Int'l. RES Jolt Squeeze Rollover Pattern Draw 35" table.
#275J Osborn Jolt Squeezers.
#601 Osborn Jolt Rollovers.
#2047-4 Osborn Power Rollovers.
#605 Osborn Jolt Rollover Pattern Draw; 54" x 24" table; 12" flask; 10" draw; portable.
Champion Push Off machines; Model LLA-45 45" x 26" table.
#815 Johnston & Jennings Jolt Rollover Pattern Draw; 30" x 40" table; 15" draw.
#918 Johnston & Jennings Jolt Rollover-Clamp, Leveler, Pattern Draw; 44" x 54" table; 18" draw; automatic take-off—Excellent condition; no pit required—Save $5,000.00.
#2 Climax Wire Straightener.

BALCHER MACHINERY COMPANY
6020 EUCLID AVENUE
CLEVELAND 3, OHIO

FOUNDRY EQUIPMENT

COMPLETE PLANT

OSBORN MOLDING MACHINES

3—#42 Rollover Portable Core Machines
1—#40 Rockover Portable Core Machine
4—#210-P Squeezer
6—#275-J Jolt Squeezer
2—#243-W Jolt Rollover Pattern Draw
2—#342-1 Jolt Rockover Pattern Draw
2—#331 Squeezer
7—#332 Jolt Rollover
4—#405 Jolt Rollover
2—#406 Jolt Rollover Pattern Draw
1—#540 Jolt Stripper
2—#559 Jolt Stripper—Portable
2—#610-13 Jolt Rollover Pattern Draw
11—#602 Jolt Rollover Pattern Draw
1—#602-19 Jolt Rollover Pattern Draw
1—#712 Jolt Squeeze
5—#721 Jolt Stripper
1—#2047 Jolt Rollover Pattern Draw
3—#2047-2 Jolt Rollover Pattern Draw

MISC. MOLDING MACHINES

2—Milwaukee #196-4C Jolt Squeeze
2—Herman Jar Rollover Pattern Draw 42" x 78" Table
2—Spo #RD-7212 Hand Rollover Power Draw
1—International #J-286 Squeezer
1—Grimes C-216 rollover

CORE BLOWERS

2—Redford Cartridge Bench Type
1—Demmler #2
2—Demmler #3-A
3—Osborn #92 with 2 Bucket Loaders
1—Osborn #192
1—Osborn #193
1—Core Drawing Machine, Air Vibrated Rapless-Newaygo

SAND MULLERS

7—Simpson #2 Mod. UD with 3 Bucket loaders, 2 Aerators National #2 and 2 Traveling Weight Larrys with Scale, Hoppers, etc.

FURNACES

36—Crucible Tilt Type Oil-Fired Aluminum Melting Furnaces, 550-lb. Cap.

SAND HANDLING EQUIPMENT

BARTLETT & SNOW

Shakeout Belt Conveyor, 16", Magnetic Pulley Motor 3 HP, Hopper & Grating 6' x 8'
Elevator #1 incl. 5 HP Motor and Reducer
Storage Bin, 20 ton
Conveyor, incl. 2 HP Motor and Reducer
Elevator #2 incl. 5 HP Motor and Reducer
Conveyor, incl. 3 HP Motor and Reducer
6—Molders Hoppers 40 CW Ft. Cap.

LINK BELT

Sand Handling System including:
Bucket Elevator, Est. 45' Hi.
Distributing Belt, 16" W. x Est. 115' Long
Feeder Belt Est. 24" W. x 15' Long
Storage Hopper, Est. 15-Ton

PALMER-BEE WEIGHING HOPPER W/

Fairbanks-Morse 2000# Dial Scales
Conveyor, Belt type 24" W. x 68' L. in Pit under Shakeout Grating
Elevator, bucket type
Conveyor, Belt Type, 18" w. x 23' long
Mixer (Revivifier) 16"

BARTLETT & SNOW

Double Knockout and Ventilating System incl.
20—Grates, Steel Knockout Type 6' x 5'
2—Hoppers, Steel Constr. 50' Long
2—Apron Conveyors, Steel 60' Centers
2—Vent Hoods w/Grated Backwall & Vent Stack
2—Blowers, Siphon Type American Size 11 w/Motor 40 HP G.E. 1180/220-440 & Controls
2—Tumblers, Barrel type Complete w/Breaker Screen w/10 HP Motor G.E. 1155/220-440 and Speed Reducer Link Belt Size 88
3—Conveyor Belts and (1) Bucket Elevator
5—Simplicity Shakeouts 4' x 6' Mod. BG
1—Link Belt Shakeout, 3' x 5'

BOHN ALUMINUM & BRASS CORPORATION
DETROIT, MICHIGAN

America's Largest Stock of Electric Melting Furnaces!

2—Swindell Top Charge 9′ dia. shell Duplexing Furnaces, 1500 KVA transformers with taps for 11,000 or 13,200 volts. New 1944, used very little. Top charge for regular heats or may be charged through trunnion for ladle or cupola metal. Amplidyne controls. May be seen in place near Chicago. (If you want a larger transformer we have 2500 KVA, 11,000 or 13,800 volts.)

1—Whiting Hydro Arc 8 MT Top Charge, 5600# per hour rate of melt, 8900# capacity of well, 8″ electrodes. Furnace new 1952. 2000 KVA transformer, 12,000 volts. Complete with American Air Filter, smoke hood and Whiting Bag Type Dust and Smoke Suppressor. May be seen in place Chicago.

1—Chicago 3000# Electric Furnace, tilt back head. 4″ electrodes, 800 KVA, 12,000 V transformer. Complete. May be seen in place Chicago.

1—Swindell Type 6 ton 9′ diameter Shell Electric Furnace, 2500 KVA transformer, 13,800 or 11,000 V. In our Chicago warehouse.

Lectromelt 1 ton Side Charge with 800 KVA, 12,000 V transformer. Late type unit. Complete. Now in our Chicago warehouse.

Lectromelt 500# Side Charge Type T, 300-375 KVA transformer, 2300 V primary, Moore controls, G. E. circuit breaker. Late type. Now in our Chicago warehouse.

Transformers—2—2500 KVA furnace transformers, 11,000 or 13,800 primary voltage.

1—Detroit Electric, 1500# capacity, 13,200 primary voltage. Kuhlman transformers. Complete with controls.

Detroit Electric 350#, Type LFA with Kuhlman transformers and oil circuit breaker, 13,200 primary voltage.

Detroit Electric with 350# and 1000# tapered shells, 2300 V Kuhlman Transformer. Complete with panelboard and bus bars.

ACME EQUIPMENT CO., INC.

126 South Clinton Street, Chicago 6, Illinois
Phone: ANdover 3-3430

We have a very large stock of good used foundry equipment. Your inquiry is appreciated.

FOUNDRY EQUIPMENT

SPECIAL BARGAINS

1—Pigmold Conveyor, 64′ sprocket centers, Link-Belt, complete with drive and controls, 220/440/3/60.

1—3-ton — 3-motor Bedford Bridge Crane, 49′ span, double built-up steel bridge with catwalk man cab, drum controls, roller collectors, 30 H.P. hoist motor, 10 H.P. travel motor, 3 H.P. Trolley motor, 220/440/3/60.

1—150 H.P. 875 CFM Ingersoll-Rand two-stage air compressor 220V, 3 ph. 60 cy., with air receiving tank, complete, can be demonstrated.

1—Lindberg Heat Treating Furnace 48″x60″, 1400°, 90 KW, 230V., with 5 H.P. Blower, complete, like new.

1—Link-Belt Roller Type Power Mold Conveyor, 27′0″x70′6″ centers, 35 cars 38″x72″, to operate in a rectangular path at speed of approximately 45 ft. per minute, complete with structural steel supporting frame work, necessary take-ups, idler corners and driving mechanism, with speed reducer, motor and controls.

1—6000 lbs. Heroult-Lectromelt Electric Furnace, 3000 KVA, 13,200 Primary volts, 239-85 Secondary volts, Delta Y, with taps, 3 ph. 60 cy., all controls.

WE BUY AND SELL ONE PIECE OF EQUIPMENT OR COMPLETE FOUNDRIES

OUR GUARANTEE:
IF YOU ARE NOT SATISFIED WITH OUR EQUIPMENT, YOU MAY RETURN IT FOR A FULL REFUND.

EUCLID FOUNDRY & MACHINE EQUIPMENT COMPANY

14919 SARANAC ROAD TELEPHONE: GLENVILLE 1-1222 CLEVELAND 10, OHIO

UNIVERSAL

MACHINERY AND EQUIPMENT CO.
320 E. BROAD ST.
SHILLINGTON, READING, PENNSYLVANIA
PHONE: READING 7-1321

AMERICA'S LARGEST STOCK—EACH MACHINE REBUILT TO FACTORY STANDARDS—SOLD WITH UNIVERSAL'S MONEY BACK GUARANTEE

AIR COMPRESSORS

1—40 HP SULLIVAN, Model B-Bim #8, WL 60 w/Receiver.
1—25 HP INGERSOLL-RAND, slow speed, horiz. ER-1, 9 x 18.

BLOWERS

1—85 HP G.E. Cupola Blower, 24 oz.
1—40 HP SPENCER, 3600 CFM, 24 oz.
3—7½ HP FISHER, 16 oz.
3—5 HP NORTH AMERICAN, 16 oz.
15—CENTRIFUGAL BLOWERS, 350 CFM to 10,500 CFM.

CLEANING EQUIPMENT

1—SLY BLAST ROOM, 8' x 10' x 7½' w/Dust Collector.
1—AMERICAN #1 MULTITABLE, 6 aux. tables 15", main table 45".
1—PANGBORN ROTOBLAST, Model GK 28, w/Skip Charger.
1—PANGBORN ROTOBLAST, Airless, #14 Barrel, 48" x 36".
1—AMERICAN TABLAST, #4
1—AMERICAN TUMBLAST, Model 570, 36" x 42".
2—SIMPLICITY SHAKEOUTS, 4' x 8'.
1—LINK BELT SHAKEOUT, 5' x 8', 5 HP Motor.
2—TUMBLING BARRELS, Cast Iron, 36" x 24" w/2 HP Motor.
2—TUMBLING BARRELS, Square, 34" x 48".
2—TUMBLING BARRELS, Side Tilt, 18" wide x 20" deep.

CONVEYORS

1—HEWITT-ROBINS, Shaker Type, vibrating, 100' long.
1—JEFFREY, 28' long, 20" belt, troughing idlers.
1—LINK-BELT, 50' long, 19" rubber belt, w/drive.
1—APRON FEED, 10'7" centers, w/drive.
1—STEEL PLATE MOLD, 90' centers, 30" belt, w/drive.
2—STEEL PLATE MOLD, 90' centers, 24" belt, w/drive.
6—SAND BELT CONVEYORS, 10' centers to 140' centers, 18" to 36" belt, complete w/drives and hoppers.
FOUNDRY TYPE ROLLER CONVEYOR—ALL SIZES—SEND REQUIREMENTS

CUPOLAS

1—WHITING, #3½, Complete w/motor and blower.
1—WHITING, #4, Complete w/motor and blower.
1—WHITING, #6, With SKIP CHARGER, motor and blower.
2—WHITING, #8, EXCELLENT CONDITION, COMPLETE.
1—WHITING, #9, SKIP CHARGER, 3 drop bottom buckets, blower, motor and SCALE.
1—MODERN, #3, 46' shell, w/blower.
1—PAXSON, #20, 15 HP Motor, Wilbraham Green Blower.

CORE BLOWERS

1—CB-400 CHAMPION. 1—3K DEMMLER.
2—#2 REDFORDS. 1—#1 DEMMLER.
2—#1 RANDALL. 1—#92 OSBORN.

DUST COLLECTING

1—CYCLONE Dust Collector, 10' dia. x 22" outlet.
1—SLY, 83" wide x 43" deep x 113" high, 4' hopper, 13" inlet, bag type.

FLASKS & CORE PLATES

400 TONS, CAST STEEL, STRUCTURAL STEEL and STERLING TYPE FLOOR FLASKS—ALL SIZES.
20 TONS, FLAT STEEL and PERFORATED STEEL CORE PLATES.
SEND FOR COMPLETE LISTINGS

FURNACES—DIRECT ARC MELTING

1—150#/hr. "LECTROMELT".
1—250#/hr. Hydraulic Top Charge.
1—500#/hr. "LECTROMELT".
1—1,000# SWINDELL
1—2 Ton WHITING top charge
1—6 Ton HEROULT.
Several 3 Ton to 10 Ton capacity Side and Top Charge Furnaces.

FURNACES—DETROIT "ROCKING"

2—200# cap. DETROIT, complete.
3—350# cap. DETROIT, complete.
1—1000# cap. DETROIT, complete.
1—3000# cap. DETROIT, less Transformer.

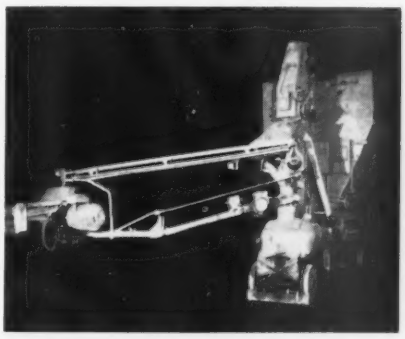
FURNACES—INDUCTION MELTING

1—20 KW AJAX Spark Gap High Frequency, 17 lb. capacity in steel.
2—60 KW, AJAX-TAMA-WYATT, Alum.
3—333 KW, AJAX-TAMA-WYATT, 1500# Alum.
1—100 KW, 960 cycle, MG set, 300#
1—100 KW, 9600 cycle, M. G. Set with 100# crucible.

FURNACES—OIL AND GAS

1—HAUSFELD Tilting #675, 250 cruc. Oil fired.
1—STROMAN Tilting, 125 cruc., Oil fired.
1—FISHER 4 Burner MNP, 1700#, gas fired.
3—WALKER YORK #400 cruc. tilting, coke fired.
2—HAUSFELD Tilting, 1200# Mag. Oil Fired.
3—MONARCH Oil Fired Stat., #60 cruc.
5—FISHER 400# Tilting, Oil fired.
1—SKLENAR, 2000#, Oil Fired.

BEARDSLEY & PIPER
MOTIVE TYPE SANDSLINGER



SEND FOR
COMPLETE SPECIFICATIONS

LADLES & POURING DEVICES

2—1,000# CYLINDRICAL, Worm Geared, 24" x 24".
1—6,000# MIXING, Worm Geared.
1—3,000# MODERN Reservoir.
2—5,000# MODERN Reservoirs.
2—6 TON TEAPOT, Worm Geared.
1—10 TON WHITING, Lip and Bottom Pour, EZ mechanism, used once.
4—10 TON BOTTOM POUR, 55" x 55".
2—15 TON BOTTOM POUR, 65" x 59".
2—45 TON TREADWELL, Excellent Condition.

MOLDING MACHINES

5—MILWAUKEE Jolt Pin Lift 32 x 38" table.
1—J & J #612 Port. Rollover.
3—INTERNATIONAL "G", 24 x 10" Jolt Rollovers.
5—OSBORN Jolt Rollovers, Hand Draw, #142.
3—OSBORN 710J Jolt Squeeze Strippers, 16 x 25" table.
3—TABOR Jolt Squeeze in Head.
1—OSBORN #243 Jolt Rollover.
1—OSBORN #559 Jolt Stripper, 25 x 30" table.
1—DAVENPORT #28A Jolt Rollover.
3—HERMAN Rollover & Jar, 6000#, 60 x 80".
10—SPO #110 J Jolt Squeezers.
11—DAVENPORT #30-T Jolt Strippers.
2—OSBORN #405 Jolt Rollovers.
2—TABOR POWER ROLLOVERS, 30 x 40" table, 20" cyl., 12" draw.
1—TABOR Jolt Stripper, 20 x 20" table, 4" draw.
1—SPO, 9336, Jolt Clamp rollover draw.

MULLERS AND MIXERS

1—SIMPSON #0, NEVER USED.
1—SIMPSON #1, Unit Drive, Late Type.
1—SIMPSON #2, style B w/Skip hoist
2—SIMPSON #3, Complete w/SKIP HOISTS.
1—CLEARFIELD #404.

MULLERS AND MIXERS (contd.)

2—CLEARFIELD #610 and #920.
1—BEARDSLEY & PIPER #60 SPEEDMULLER, 60 HP motor, SKIP LOADER.
1—LINK-BELT REVIVIFIER, Size 5.

OVENS

2—FOUNDRY EQUIPMENT, 2 compartment, 5' wide x 6' high x 10' deep, Oil Fired, Recirculating, Walk-in.
1—FOUNDRY EQUIPMENT, Oil Fired, 4 drawers.
1—CRAWFORD, Gas Fired, 3 drawers.
1—HOTPOINT EDISON, ELECTRIC, 6 drawers, 30" x 40" x 8".
2—MORRISON, rack type, gas, 8'x8'x7', recirculating
1—CORE OVEN, 82" high x 6' deep x 12' wide, 2 sets of drawers, gas or oil.
1—YOUNG BROS. 3 compartment, kiln type baking oven, electrically heated, with CONTROLS.
1—MAHON ANNEALING OVEN, GAS FIRED, 9' x 18' x 6½', 1600 degrees F., controls recirculating.

SAND CUTTERS

6—AMERICAN SAND CUTTERS—
1—MODEL "AA", 60" reel, Gas Driven.
1—MODEL "K", 72" reel, Gas Driven.
1—MODEL "F", 80" reel, Gas Driven.
1—MODEL "D", 76 x 96".
1—48" Cutting Reel.
1—SANDMASTER, 70/102, New in 1950, Rubber Tires.

SAND LABORATORY EQUIPMENT

1—TEST CORE BAKING OVEN #606.
1—SAND RAMMER #315.
1—MOISTURE TELLER #278T.
2—UNIVERSAL TENSILE MACHINES #401.
2—PERMEABILITY METERS.

SAND PREPARATORS

1—REDDY SANDY UNIT.
2—JEFFREY SANDITIONERS, Portable.
5—SCREENERATORS, Size "S" and "M".
3—ROYER SAND BLENDERS, 16" belt, 12" belt, 8" belt.
2—B & P SAND CONDITIONERS, portable.
1—LOWE GYRATORY RIDDLE.
1—HETHRINGTON & BERNER SAND DRYER, rotary, oil fired, #552.
1—CLAM SHELL BUCKET

SAND SLINGERS

1—BEARDSLEY & PIPER MOTIVE JR. 19" head see illus.
1—BEARDSLEY & PIPER TRACTOR TYPE 16" head, magnetic separator.
2—PORTABLE SLINGERS, 16" head, 4' long, on Trucks.

TESTING MACHINES

1—TINIUS OLSEN, UNIVERSAL, 100,000# capacity.
1—TINIUS OLSEN, BRINNEL HARDNESS, 3,000 KG.
1—RIEHLE, UNIVERSAL, 2 screw mechanical, 100,000# capacity.
1—RIEHLE, BRINNEL HARDNESS, hydraulic, 3,000 KG.
1—ROCKWELL, HARDNESS, #5JR with "C" Brail.
1—BALDWIN - TATE - EMERY, UNIVERSAL, Hydraulic tensile, 24,000#.

TRUCKS

3—CLARK, FORK LIFT, 10S" lift, Gas driven, low price.
2—HOUGH PAYLOADERS, 1000# capacity, EXCELLENT condition.
2—BELL PRIME MOVERS, 1000# capacity, Gas driven.

SPECIALISTS IN APPRAISAL AND COMPLETE FOUNDRY LIQUIDATIONS

UNIVERSAL

MACHINERY AND EQUIPMENT CO.
320 E. BROAD ST.
SHILLINGTON, READING, PENNSYLVANIA
PHONE: READING 7-1321

FOR SALE

AIR COMPRESSORS

Ingersoll Rand Type 10—14 x 9 x 12, 2 stage, 75 HP, 3/60/220/1200 rpm synchronous motor, 350 CFM at 100#.

5 x 5 Ingersoll Rand 10 HP motor.

Ingersoll Rand Type 10, 800 CFM, XRB2, 16" stroke 20" x 12½" cylinder, 2 stage compressor, 206 HP, 220 volt motor, with starter and air receiver. Complete. This unit was rebuilt in 1952 by Earl Knox Co.

Ingersoll Rand Type 10, 800 CFM, 2 stage air compressor, 200 HP, 220 V motor. This is an older unit. No starter or air receiver. Overhauled in 1951.

Sullivan Vertical Single Stage 100 HP air compressor, 220 volt motor, with starter and air receiver.

BLOWERS

Spencer Turbo Blower, 2250 CFM at 16 oz. 15 HP 3/60/220 totally enclosed motor. New 1947.

Ingersoll Rand Motor Blower Type FS. Single Stage 4000 CFM @ 3.75 PSI, 100 HP, 220 V, G.E. Induction Motor.

Buffalo 7E Direct Connected Blower, 50 HP Westinghouse motor, 3/60/220-440 V, 3535 rpm, 28" wheel, 3500-4000 CFM at 32 oz. Flanged outlet.

Spencer Turbo Blower, New 1949. 3500 cfm, 28 oz. with 40 HP 220-440 motor and Foxboro controls.

General Electric 7500 CFM, 20 oz., 89.6 Max HP, 220 V motor. Airway controls.

CONVERTER

100 KW Rotary Westinghouse 220 V 60 cycle primary 250 V DC, complete with controller and panel.

CORE BLOWERS

International SB 13.

Federal Sandblo CB40B, like new.

Demmler #50.

Peterson Core Blower (Similar to Demmler #50).

CRANE LADLES, GEARED

1—42" x 47" Crane Ladle.

2—44" x 44" Crane Ladles.

CRANES

5 Ton P & H Overhead Elec. Traveling Crane, 30'6" span, 15' lift (can be increased) 3 motor, 220 V A.C. New 1946.

10 Ton Northern Overhead Elec. Traveling Crane, double girder, fish belly, 3 motors, 230 V D.C., 54'7½" wide C to C of wheels can be cut down to fit smaller size.

American 15 ton Diesel Locomotive Crane, 55' boom, 8 wheel trucks, standard railroad gauge.

CRUSHERS—PULVERIZERS

1—Stedman 15" x 12" Type A. With 10 HP 220-440 V motor.

DUST COLLECTORS

Whiting Dust Suppressor, bag type, 12,000 CFM, 30 HP motor to handle hot fumes from electric furnace hood. New 1953. Cost us over $14,000 before erection and without wiring or duct work.

GRINDERS, DISC

Besley 208 Double End 26" x 2⅜" wheel with 2 compound tables, V belt drive, 15 HP, 220-440 totally enclosed motor, magnetic starter controls.

2—U. S. Model 80 Double End 2-18" dia. wheels, 7½ HP motor, 2 swinging tables 8" x 14"—1 with hand lever feed.

GRINDERS, SNAGGING

McCabe 2" x 24" wheels, 48" between wheels, 3/60/440 V.

1—Hammond type 20 WR2—3" x 24" wheel, double end grinder, single speed, 20 HP Louis Allis Squirrel Cage, 220-440 V—1760 rpm motor.

1—U. S. DE, Model 65, 3" x 24" wheels, variable speed, 20 HP motor.

Hisey Wolf adjustable speed 15 HP 30" x 3" wheels, 220/440 V motor.

Kling Bros. 30" Double End Snag Grinder, heavy duty, 15 HP motor.

Kling Bros. 18" Double End Snag Grinder, heavy duty.

GRINDERS, SWING

2—Fox 10 HP 3/60/220-440 V, Swing Frame.

U. S. 15 HP, 3/60/440 V Swing Frame, 2 speed.

Fox 15 HP Swing Frame, 2 speed.

Marschke 20 HP, 2 speed.

HOISTS

1000# Cleveland 220/440 V.

1000# Detroit 220/440 V.

5—1000# P & H Hevi Duty with trolley.

2—2000# P & H Hevi Duty with trolley.

11—4000# P & H Hevi Duty with trolley.

2—4000# P & H Hevi Duty with trolley and powered drive unit for moving hot metal.

LADLES

1 Ton Enclosed Gear Crane Ladle truck type 4 wheel car for 18" gage track, Whiting Junior.

MOLDING MACHINES

2—Champion Pin Pushoffs, 38" x 40"—12" draw.

1—Johnston & Jennings 1015 Jolt Pin Lift, 30" x 38" table.

1—Champion Hand ram, hand clamp, hand rollovers 26" x 14" table.

1—Champion Hand Ram, Hand rollover, Hand draw core machines, 15 x 15 bed.

3—Davenport Portable Jolt Rollover Pattern Draw 20" x 24" tables, open end, 8" draw.

1—International Type G 24 x 10 Jolt Rollover, foot draw, 22 x 30 table, 10" draw.

1—Herman Molding Machine Jolt Rollover Pattern Draw, 20 x 30.

1—Herman Molding Machine Jolt Rollover Pattern Draw, 20 x 36.

1—International Type G 30 x 12 Jolt Rollover Foot Draw, 28" x 36" table, 12" draw.

1—International Type G 30" x 30" table, 9" draw, Portable.

2—International Type G 18" x 56" table, 8" draw. Portable.

1—International Type F Jolt Rollover 27 x 12, 12" draw, 35" x 26" table.

1—International Jolt Rollover Pattern 10" Draw, 22" x 30" plate, 6" jolt cylinder.

1—International Plain Jolt Molding Machine 48" x 60" table, no pit required.

1—Herman Jolt Rollover Pattern draw, 40" x 84" table, slotted nickel alloy table over regular table to accommodate various sized flasks, air clamp, new 1946. Used very little.

1—Herman 20" x 30" rollover pattern draw, 750# series. Air clamp.

2—Herman 20" x 24" Jolt Rollover Pattern Draw, 750# series. Air clamp.

1—Herman 4000# Series High Speed Rollover 30" x 60" with 32" x 48" bumper, 13" cylinder pattern device.

2—Milwaukee Arm Type Jolt Squeeze Strippers, 1500# capacity, Model 163-50 Serial 13104-5, 15" x 24" table, 16" x open end, pattern size. Late type.

1—Osborn 76J Portable Jolt Squeeze Molding Machine 12" cylinder.

2—Osborn 405 Jolt Rollover 40" x 70", 2000# capacity, 20" x 60" jolt table and 4 wheel receiving car.

1—Tabor 1000# Rollover, 30" x 60" table.

4—Spo 214 Jolt Squeeze Pin Lifts.

Hermann 6000# capacity Jolt Rollover Draw, 50" x 74" table. New 1948.

Davenport 40A Jolt Roll Draw, air clamps, rollout conveyor, 44" x 66" table. Max. flask size 44" x 84".

Milwaukee 2542 Jolt Pin Lift used as companion to the above Davenport. 38" x 42" table. Serial 14805.

MULLERS AND MIXERS

Simpson #2 Motor on base.

Simpson #3 Motor on base.

Simpson #3 Type H open gear type.

Simpson #3 Open Gear Type. $1000.00.

American Model M Sand Cutter, 70" blades.

Royer NDP 47 14" Belt, 4 rubber tires.

B & P #60 with skip loader.

B & P Speedmuller 80 w/cooling blower.

PREPARATOR

B & P #70 Preparator. Only used 8 months.

RIDDLES

Champion Sand Riddle, floor type.

Universal Sand Riddle.

ROTOBLAST

Pangborn, table with 3-8" rotating work tables, 3 position loading, cleaning and touch-up designed for work similar in size to aircraft cylinders. Like New condition.

SAND HANDLING EQUIPMENT

Blaw Knox Sand Grab Bucket for crane use.

Simpson #3 Muller with bucket loader.

1—24'-20" belt conveyor, magnetic pulley.

SHAKEOUTS

2—4' x 6' Simplicity.

1—4 x 6 Simplicity, 15,000# capacity.

Simplicity 4' x 6' DE type Heavy Duty, 15,000# capacity, 15 HP 220-440 V motor.

SPEED REDUCERS

We have a large stock of speed reducers and geared head motors. Write us your needs.

TUMBLING BARRELS

2—Sly 42" x 48" dia. barrels, master geared head motor drives.

WHEELABRATORS

1—American Wheelabrator 48" x 48" with loader, 220/440 V motors.

1—American Wheelabrator 36" x 42" with loader, 220/440 V motors.

WIRE STRAIGHTENERS

2—Climax 1 HP motor.

FLASKS

Hines Popoff and Jackets

1st Figure is Depth of Cope
2nd Depth of Drag

1—12" x 16" flasks 5/7
2—12" x 16" flasks 6/5
1—12" x 16" flask 7/5
1—12" x 16" flasks 7/7
1—12" x 16" Extra 4½" drag
13—12" x 16" C.I. Jackets
1—12" x 18" flask 5/4
2—12" x 18" flasks 6/6
1—12" x 18" flask 7/7
1—12" x 18" extra drag 5"
1—12" x 18" extra drag 7"
11—12" x 18" C.I. Jackets
1—12" x 20" flask 5/5
1—12" x 20" flask 5/7
2—12" x 20" flasks 7/5
1—12" x 20" extra 5" drag
8—12" x 20" C.I. Jackets
2—12" x 22" flasks 5/5
8—12" x 22" C.I. Jackets
1—12" x 26" flask 5/5
11—12" x 26" C.I. Jackets
1—12" x 30" flask 5/5
11—12" x 30" C.I. Jackets
1—18" x 26" flask 5/5
8—18" x 26" C.I. Jackets
2—20" x 20" flasks 6/6
7—20" x 20" C.I. Jackets
2—24" x 24" flasks 8/8
1—24" x 24" 3" drag upset
1—24" x 24" extra 6" cope upset
8—24" x 24" C.I. Jackets
2—34" x 34" flasks
10—34" x 34" C.I. Jackets

ACME EQUIPMENT CO., INC.

WE WILL BUY FOR CASH A SINGLE PIECE OF EQUIPMENT OR YOUR ENTIRE FOUNDRY

126 South Clinton Street Phone: Andover 3-3430 Chicago 6, Illinois

The AAA trademark is your assurance of the Finest in Factory REBUILT Equipment. BUY NOW with Complete Confidence. NO RISK INVOLVED. Ask about our NEW SALES POLICY.

AAA MACHINERY & EQUIPMENT CO.

15539 SARANAC ROAD **CLEVELAND 10, OHIO**

PHONE: LIBERTY 1-6545

MOLDING MACHINES

3—**SPO** No. 506 Jolt Rock-Over Pattern Draw Machines, 24" x 25" table, 10" draw, 600 lbs cap Portable or Stationary.
2—**SPO** No. 507 Jolt Rock-Over Pattern Draw 32" x 40" table, variable draw 10" to 20", 1500 lbs cap. 1948 models.
1—**SPO** No. 508 Jolt Rock-Over Pattern Draw Machine, 28" x 30" table, draw 9" cap. 1200 lbs. Jolt cap.
1—**SPO** No. 413-D Jolt Squeeze Power Rock-Over Pattern Draw 24" x 25" table, 10" draw, 600 lb cap. max. flask 26" x 36".
1—**SPO** No. 213-D Jolt Squeeze Strip Machine table 19" x 28", 8" draw, 800 lbs.
7—**SPO** No. 110J Jolt Squeezers, Portable.
4—**SPO** No. 2146 Jolt Squeeze Strippers, table 23" x 31", draw 6", 1000 lbs jolt cap. NEW in 1953.
3—**OSBORN** No. 559 Portable Jolt Strippers 25" x 30" table, 1200 lbs jolt.
2—**OSBORN** No. 601 Jolt Rollover Pattern Draw, 600 lbs cap. overall flask 30".
6—**OSBORN** No. 275 J. Jolt Squeezers.
2—**OSBORN** No. 142 Jolt Rollover Foot Draw 14½" x 24" table, 8" draw, 350#.
1—**OSBORN** No. 710J Jolt Squeeze Pin Lift, 16" x 25" table, 6" draw, 10" squeeze cyl.
1—**OSBORN** No. 712PJ Jolt Squeeze Pin Lift, 18" x 28" table, 6" draw, 12" squeeze cyl.
2—**HERMAN** 40" x 60"—13" Diam. Cyl. Heavy Duty Bumper Plain Jolt Machine.
1—**JOHNSTON & JENNINGS** No. 918-B Jolt Rollover Pattern Draw, 44" x 54" table, 18" draw 3000 lbs capacity.
2—**JOHNSTON & JENNINGS** No. 815-B Jolt Rollover Pattern Draw, 30" x 40" table, 15" draw, 1500 lbs cap. air operated head.
1—**TABOR** 22" Shockless Jar, Rollover & Pattern Draw, 22" x 42" table, 10" draw, 600 lbs cap. portable.
2—**TABOR** 30" Shockless Jar Rollover & Pattern Draw, 30" x 40" table, 12" draw, 1000 lbs. cap. Portable or Stationary.
2—**INTERNATIONAL** RES Jolt Squeeze Rollover Draw Size 15" x 8" draw, flask cap. 24" x 42" O.D.
1—**INTERNATIONAL** PKL Jolt Squeeze Air Pin Lift 18" x 24" table, 5½" draw.
2—**INTERNATIONAL** G Jolt Rollover Foot Draw 18" x 56" table, 8" draw, (other 20" x 8").
1—**DAVENPORT** #28SA Jolt Rollover & Pattern Draw 30" x 40" table, 12" draw, 1500 lbs cap. Serial #1191.
1—**MILWAUKEE** #1030 Jolt Pin Lift, 28" x 34" table, 12" draw, 1000 lbs cap.
3—**MILWAUKEE** No. 124-6 Jolt Squeeze, 17" x 26" table, 12" cylinder, Portable.

SAND PREPARATORS

8—**BEARDSLEY & PIPER** Models "S"-"M"-"L" Screenerators, portable units.
1—**BEARDSLEY & PIPER** #70 Portable Sand Preparators with magnetic separator, 90 cu. ft. hopper, gyrating screen, aerator, 1946 unit, ser. #SC-73.
1—**AMERICAN** Sand Cutter Model AM, size 69/45—serial #176—motors enclosed.
1—**AMERICAN** Sand Cutter Model BD, size 75/60—serial #722—motors enclosed.
1—**ROYER** Model NC-4 Portable Sand Conditioner, 12 to 15 tons per hour cap.
2—**ROYER** Model C-2 Portable Sand Conditioners, 25 to 30 tons per hour cap.

SHAKEOUTS

1—**ROYER** Shakeout & Sand Conditioning Unit, Serial No. ST-47.
1—**SIMPLICITY** 4' x 6' Model B Serial No. 46-SOB-145, 5000 lbs cap.
1—**SIMPLICITY** 2' x 3' Gyrating Sand Screen—single deck—Model CA—Motorized.

CORE BLOWERS

3—**OSBORN** No.'s 91 & 92, with air clamps.
2—**REDFORD** No. 1, Cartridge Bench Type.
1—**DEMMLER** No. 1 with Air Clamps.
1—**DEMMLER** No. 2 with Air Clamps.
1—**DEMMLER** No. 3K with air clamps, cores to 25 lbs cap. 1953 unit.
1—**CHAMPION** No. CB-400, weight of core to 300 lbs, draw 6½".

AIR & ELECTRIC HOISTS

4—**INGERSOLL-RAND** Size C, 2000 lbs.
7—**INGERSOLL-RAND** Size D, 4000 lbs.
1—**INGERSOLL-RAND** Size DR, 2000 lbs.
2—**INGERSOLL-RAND** Size E, 10,000 lbs.
2—**INGERSOLL-RAND** Size D-6, 6000 lbs.
1—**CHICAGO-PNEUMATIC** Model A, 1000#.
1—**ELECTRO-LIFT** 3000 lbs capacity, low head room, cable type, 4 Hp motor.
4—**AMERICAN** Engineering Type A1, 2000 lbs cap. 220/3/60 cycle, for tramrail.
1—**SHAW BOX** 3 ton capacity "Load Lifter" 220/440/3/60 cycle, on 20' crane span.
1—**DETROIT** 5 ton cap. Model LHR, 440 volt Ser. #19317E 1953 unit.

SAND BLASTING EQUIPMENT

1—**AMERICAN WHEELABRATOR** 27" x 36" Tumblast w/skip hoist, shot return electrical etc. Ser. #A63757.
2—**AMERICAN WHEELABRATOR** 66" Diameter Swing Tables, w/short return, dust collector, Ser. #82610, 1952 unit.
1—**PANGBORN** No. GK-2 Roto-Blast Barrel w/bucket loader etc. 7 cubic feet cap., drum size 30" x 38", airless type, 1943.
2—**PANGBORN** EP-5 Shot Blast Cabinet 5' x 4' x 7' shot return, pressure tank.
1—**PANGBORN** Shot Blast Room, 10' x 10' x 12' walk-in type, with pressure tank, nozzles, hoses, elevator etc.
1—**PANGBORN** Roto-Blast Table 6' Diam. with 6-20" tables, Model LG.

TUMBLING BARRELS

1—**WHITING** 30" x 60" with 5 HP Gearhead motor & drive, 1952 unit.
5—**SLY** 36" x 60" with 5 HP Gearhead motor & drive—built-in magnetic brake.
2—**SLY** 42" x 72" Square 10 HP Gearhead motor & drive—built-in magnetic brake.
1—**SLY** 42" x 66", Type C, 10 HP gearhead motor drive—built-in magnetic brake.
1—**NEW HAVEN** Air Blast Barrel 42" x 48" with motor & drive etc. 1942 unit.

B & P SAND SLINGERS

1—**B & P** Tractor Type 13' w/magnetic 4" liner & cups, 19" head, w/spare head 22"-5" liner & cups—25 HP.
1—**B & P** Tractor Type 13' w/magnetic tower, 16" head, 4' ramming, 4" tip, 1946.

CUT-OFF SAWS & MACHINES

1—**TABOR** Type B7½AC, cut-off saw, with 7½ HP motor, 16" wheel.
2—**TESSEMER** Model H, Sprue Cutter ¾" cap. brass, with 3 HP motor.
2—**CLIMAX** #2A Wire Straighteners, 4 Sizes 1/16" to ¼" with 1 HP V-belt.

CORE OVENS

3—**GEHNRICH** Single compartment recirculating gas fired, with all controls etc. 6' W x 11' L x 7' H walk-in type.

GRINDING EQUIPMENT

2—**FOX** No. 5 High Speed Stand Grinders, wheel size 24" x 3" w/10 HP motor.
1—**FOX** No. 7 High Speed Stand Grinder, wheel size 30" x 3", w/15 HP motor.
2—**HAMMOND** WR-1 Double End Snagging 7½ HP—wheel size 20" x 3" x 10".
1—**HAMMOND** WR-1 Double End Snagging 10 HP—wheel size 24" x 3" x 10".
1—**STANDARD** #30 Double End Multi-Speed Model 101—10 HP—wheel 24" x 3".
1—**U. S.** Double End Snag, Model 65, 20 HP-4 speed unit, wheel 24" x 3".
1—**MARSCHKE** Swing Frame, 3 HP-220/440.
3—**MARSCHKE** Swing Frame 15 HP 2 speed unit, wheel size 24" x 3" x 12".
3—**MARSCHKE** Swing Frame 20 HP—3 speed units, wheel size 24" x 3" x 12".
1—**QUEEN CITY** Model 100 Double End Disc, 10 HP motor, wheel 20" x 2" x 2".
1—**U. S.** Electric Swing Frame, 15 HP, 2 speed unit, wheel size 24" x 3" x 12".

CONVEYORS—ROLLER-APRON-BELT

1000'—**MATHEWS** Gravity Roller, 10" wide 2½" roller dia. 4" centers.
1200'—**MATHEWS** Gravity Roller 14" wide—2¾" diam. 4" centers, above rail.
200'—**MATHEWS** Gravity Roller 16" wide—2¾" diam. 4" centers, above rail.
1—**FARQUHAR** 18" x 35' Model 343, portable trough with 5 HP motor and elect.
1—**FARQUHAR** 18" x 19' Model 341 Undercar unloader, rubber belt, 5 HP motor.
1—**LINK-BELT** Steel Apron 18" x 24'.
125'—**LOUDEN** Monorail, complete with four 20' bridges and all accessories.
300'—**STANDARD** Gravity Roller 24" wide, 3½" diam. on 6" centers, 6" channel.
150'—**STANDARD** Gravity Roller 12" wide, 3½" dia. on 4" centers, 6" channel.

ELECTRIC FURNACES

3—**DETROIT** Type AA, Rocking, 1500 to 2000 lbs cold charge, w/400 KVA transformers 4650 primary volts, single phase.
2—**DETROIT** Type AA, Rocking, 750 to 1000 lbs cold charge, w/250 KVA transformers, 4650 primary volts, single phase.
1—**PITTSBURGH-MOORE** Electro-Melt Furnace Model CQ, 4000 lbs capacity, less transformer & switch gear, 1939 unit.

SAND MULLERS

1—**SIMPSON** No. 0, style B & C, 3' pan diam. 175 lbs batch, 5 HP V-belt drive.
1—**SIMPSON** No. 1 style B, single wheel type, open gear, 4' pan diam. 400 lb. batch size, with 5 HP motor and reducer.
2—**SIMPSON** No. 1 H. style K, Unit Drive type, 4' pan diam. 500 lbs batch, 2 muller wheels, w/ 5 HP Master unit drive and skip hoist loader.
1—**SIMPSON** No. 1½ style UD, unit drive type, 4' 6" pan diam. 700 lbs batch size, with 7½ HP Master Unit Drive.
5—**SIMPSON** No. 3, Style C, Separate Drive 8' pan diam. 3000 lbs batch, 40 HP motor & Falk Reducers, serial No.'s in 58,000's, 1946 units, Gear enclosed.
1—**BEARDSLEY & PIPER** No. 60 Speed Muller, Model G, 10 cubic ft. batch size, with 50 HP motor and all electrical.
1—**BEARDSLEY & PIPER** No. 30 Speed Muller 3 cubic ft. batch size, with motor & electrical, serial No. 30-2.
1—**SIMPSON** #2 style UD, unit drive type, 6' pan diameter, 1500# batch size, with skip hoist loader, aerator and all electrical, etc.
1—**CLEARFIELD** #404, with 5 HP master motor, etc. 4 cubic feet capacity.
1—**BEARDSLEY & PIPER** No. 50 Speed Muller, 7½ cubic feet batch size, w/skip hoist loader, 50 HP motor, Ser. #50-12.
1—**PORBECK** Model 3½ Core Sand Mixer, on pneumatic tires, w/1½ HP motor etc.

GAS & OIL FIRED FURNACES

3—**LINDBERG-FISHER** Model MNP, size 2400, gas or oil fired, w/motors-blowers, NEW pots, electrical tilting mechanisms.
5—**LINDBERG-FISHER** #400 Crucible, Type BBI, hand tilting, gas or oil fired, with motors-blowers, 1950 units.
1—**STROMAN** #600, Model U Tilting Reverberatory, gas or oil fired, w/motor-blower, 1949 unit.
2—**STANDARD** #30-#150 Cruchile, Stationary gas or oil fired, w/motor-blower.

CUPOLA & FURNACE BLOWERS

1—**GE** Centrifugal Type FS3670-9400 Serial #27006, w/motor 100 HP, 3600 RPM.
1—**BUFFALO FORGE** No. 7-E, 25 HP-32 oz. 1600 CFM, 28" wheel.
9—Furnace Blowers 1-5-7½ HP-16 oz.

LADLES & POURING DEVICES

10—**WHITING** Riveted Crane Ladles, taper side with V-bail (E-Z Pour) enclosed gearings nose pouring, ½-1-2-3-4-5 ton.
6—**MODERN** 1500# Cylindrical Geared, with crane bails & floor stands, NEW covers, 30" dia x 29" length.
3—**MODERN** Mixing Ladles, on trunnions, geared, covered & lined, (2-40" x 60") 1-36" x 36", with preheaters.
6—**INDUSTRIAL,** Lip pour, 24" diam, x 24" H, 1600 lbs cap. Enclosed Timken gear.
12—**WHITING** Models 1000 & 2000 Pouring Device w/500# ladles, hand tilt devices.
6—**MODERN** Models F-FA-FA-9 & F-9 Pouring Devices with 500 Lb. covered ladles, trolley, & hand Tilt devices.

BUCKET ELEVATOR

1—**JEFFREY** 50' centers of drive pulleys, 106' belting 13", with continuous type buckets, Jones Reducer, motor etc.

CUPOLA CHARGER

1—**WHITING** 3 Ton Tiger Monorail, type 2 motor wishbone charger, cab operated, with controls, 5 buckets etc. 80' tram beam track & conductor. Buckets 48" x 52" w/super structure, 1953 unit.

HOUGH PAYLOADERS

1—Model HA, 10 cubic feet bucket, hydraulically controlled, pneumatic tires, REBUILT 3 months ago, serial #14783.

MOLD CONVEYOR

1—**PALMER** "B" w/no. HD-12 speed reducer & Reeves variable drive 4-1 ratio, 200' straight track, 7-3' sections 90° curves 1-6' section; 2-1' section 30° curves, car size 18" x 42", 80 cars, 1948.

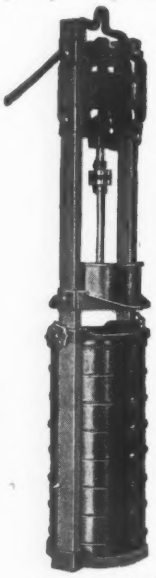
NO MORE RIDDLE-'RASSLING!

Combs Gyratory Foundry Riddles combine smooth, even motion with fast, low-cost operation!

Whether you screen core or molding sand, you'll find that Combs Riddles provide thorough sifting, mixing, aerating—whatever the job calls for.

Write today for illustrated folder which describes just the Combs Riddle for your plant.

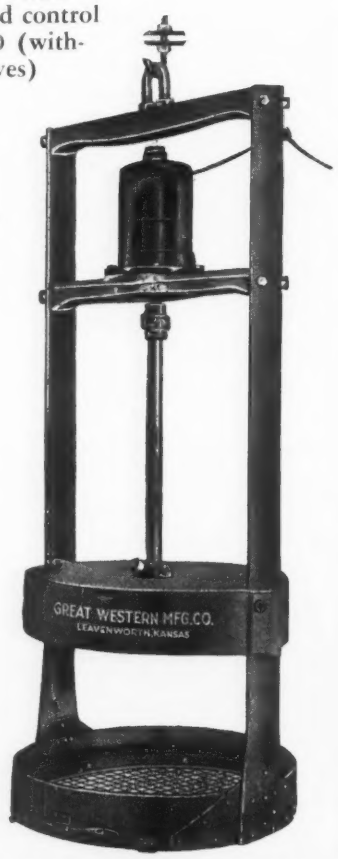
TYPE "V"
with 20″ sieve $250.00
also made with
36″ sieve $450.00



TYPE "HL"
LAB SIFTER
for sand control
$225.00 (without sieves)

TYPE "CS"
with 24″ square screen and automatic discharge
$320.00

TYPE "CR"
with 24″ sieve
$310.00



These Combs Foundry Riddles cost less than 1¢ an hour for power. You can remove the steel rim, empty it and replace it in just seconds. You save up to 97% on your labor costs.

Prompt Delivery From Your Foundry Supply House

GREAT WESTERN MANUFACTURING CO.
LEAVENWORTH, KANSAS

Step ahead in this five billion dollar market with

Foundry's PLUS 5 SERVICE

What is PLUS 5? It's your key to more business from foundries. It gives every FOUNDRY advertiser a bonus he can get from no other source. Here is help in analyzing this market—studying sales territories and potentials—planning the sales effort—and creating a constructive promotion program to the 5 billion dollar foundry market. It's time to take a new look at this market—and at the unusual selling aids we have for you. Say PLUS 5 to your FOUNDRY representative and he'll show you this 5-step program designed to move more of your products into foundries.

A Penton Publication
FOUNDRY
more than a magazine . . . a complete sales development service

Penton Building, Cleveland 13, Ohio

ADVERTISING INDEX

A

Abrasive Shot & Grit Co., Inc. 215
Acheson Colloids Co. 169
Acme Foundry Co. 257
Adams Co., The 62
Aeroquip Corp. 67
Ajax Electric Co., Inc. 180
Ajax Electric Furnace Co. 180
Ajax Electrometallurgical Corp. 180
Ajax Electrothermic Corp. 180
Ajax Engineering Corp. 180
Allied Chemical & Dye Corp., Semet-Solvay Div. 250
Allied Chemical & Dye Corp., Solvay Process Div. 198
Allis-Chalmers 51
American Air Filter Co., Inc. 183
American Air Filter Co., Inc., Herman Nelson Div. 256
American Brake Shoe Co., Electro-Alloys Div. 20
American Bridge Div., United States Steel Corp. 49
American MonoRail Co. 134
American Wheelabrator & Equipment Corp. 46, 128, 153
Apex Smelting Co. 167
Archer-Daniels-Midland Co., Foundry Products Div. 4, 5
Automotive Pattern Co. 247

B

Babcock & Wilcox Co., The, Refractories Div. 26
Bailey, William M., Co. 192
Baker-Raulang Co., The 28
Barber-Greene 258
Bartlett, C. O., & Snow Co., The Back Cover
Bay State Abrasive Products Co. 146
Beardsley & Piper Div., Pettibone Mulliken Corp. 175, 176, 216, 217
Beryllium Corp., The 234
Black, Sivalls & Bryson, Inc. 17

C

Campbell-Hausfeld Co., The 208
Carborundum Co., The 43, 58, 160, 250
Carl-Mayer Corp., The 119
Carman, Edwin S., Inc. 262
Cedar Heights Clay Co. 155
Centrifugal Casting Machine Co. 261
Chicago Eye Shield Co. 74
Chicago Pneumatic Tool Co. 127
Christiansen Corp. 29
Cincinnati Milling Machine Co., The, Cincinnati Milling Products Div. 16
Cities Service Oil Co. 229
Clark Equipment Co., Construction Machinery Div. 37
Clearfield Machine Co. 27
Cleco Div. of Reed Roller Bit Co. 36
Cleveland Crane & Engineering Co., The, Cleveland Tramrail Div. 73
Cleveland Flux Co., The 139
Cleveland Metal Abrasive Co., The 194
Cleveland Quarries Co., The 235
Cleveland Tramrail Div., The Cleveland Crane & Engineering Co. 73
Cleveland Vibrator Co., The 211
Columbia-Southern Chemical Corp. 259
Cooper-Bessemer Corp., The 71
Corn Products Refining Co. 66
Crobaugh, Frank L., Co., The 260

D

Danko Pattern & Mfg. Co., Inc. 262
Davenport Machine & Foundry Co. 157
Dayton Pneumatic Tool Co. 259
DeBardeleben Coal Corp. 257
Delta Oil Products Co. 59
Demmler, Wm., & Bros. 39
Denver Equipment Co. 18
Desmond-Stephan Mfg. Co., The 236
Detroit Electric Furnace Div., Kuhlman Electric Co. 13
Detroit Testing Machine Co. 253
Dietert, Harry W., Co. 261
Dings Magnetic Separator Co. 151
Dow Corning Corp. 201
Durez Plastics & Chemicals, Inc. 179

E

Eastern Clay Products Dept., International Minerals & Chemical Corp. 165
Eastman Kodak Co., X-Ray Div. 121
Eaton Chemical & Dyestuff Co. 256
Electric Furnace Co., The 262
Electro-Alloys Div., American Brake Shoe Co. 20
Electro Metallurgical Co., A Div. of Union Carbide & Carbon Corp. 24

F

Federal Foundry Supply Co., The 2, 22, 23
Flexible Steel Lacing Co. 252
Foundry Equipment Co., The 47
Fremont Flask Co., The 56
Fuller Co. 185

G

Gardner-Denver Co. 50
Girdler Co., The, A Div. of National Cylinder Gas Co. 63
Great Lakes Carbon Corp., Electrode Div. 241
Great Western Mfg. Co. 272

H

Harbison-Walker Refractories Co. 11
Harnischfeger Corp., Welding Div. 193

Continued on Page 274

FOUNDRY

BUSINESS STAFF

GEORGE A. POPE, *Business Manager*

MARY JANE KIMPEL, *Advertising Service Manager*

JEANNE R. FRANKLIN *Staff Assistant*

Advertising

New York ..... J. F. AHRENS, J. L. OZANNE
Chicago ..... A. W. JOHANSEN, L. R. HETKE
Cleveland ..... A. L. KLINGEMAN, J. K. GILLAM
San Francisco ..... F. J. FULLER, ROBERT W. WALKER CO.
Los Angeles ..... F. J. FULLER
Griffin, Ga. ..... F. J. ALLEN
London ..... VINCENT DELPORT

Market Research and Promotion

DAVID D. GIBBS, *Manager*
MILDRED CHRISTOPHER
HELEN SMITH

Circulation

G. R. EBERSOLE, *Manager*
BETTIE COOK, *Assistant Manager*
FLORENCE BELL
MARIJEAN HAGAN
FRIEDA BUEHNER

Classified Advertising

DOLORES BRANT, *Manager*

Production

RICHARD J. STRNAD, *Manager*
ELIZABETH MERCER

Main Office

Penton Building, Cleveland 13, Ohio
Main 1-8260

Branch Offices

New York, 17 ..... 60 East 42nd St.
Murray Hill 2-2581
Chicago, 11 ..... 520 N. Michigan Ave.
Whitehall 4-1234
Detroit, 26 ..... 1249 Washington Blvd.
Woodward 3-3488
Los Angeles, 48 ... 6262 Commodore Sloat Dr.
Webster 1-6865
Pittsburgh, 19 ..... 2837 Koppers Building
Atlantic 1-3211
San Francisco, 4 ..... 57 Post St.
Sutter 1-5568
Washington, 4 ... 1123 National Press Building
Executive 3-6849
London ..... 2 Caxton St.
Westminster, S.W. 1
Griffin, Ga. ..... 331 South 12th St.

Published monthly by

THE PENTON PUBLISHING COMPANY

G. O. HAYS ..... *President and Treasurer*
R. C. JAENKE ..... *Executive Vice President*
F. G. STEINEBACH ... *Vice Pres., and Secretary*
F. O. RICE ..... *Vice President*
J. P. LIPKA ..... *Asst. Secy. and Asst. Treas.*
Also publisher of STEEL • MACHINE DESIGN
NEW EQUIPMENT DIGEST • AUTOMATION

Subscription: United States, possessions and Canada, one year $5; two years $8. Other foreign countries, one year, $10. Single copies 75 cents. Copies published three months or more previous to date of current issue, $1.00.

Member: National Business Publications, Inc.; and Society of Business Magazine Editors. Copyright 1954 by THE PENTON PUBLISHING CO.

Entered as second class matter at postoffice at Cleveland, Ohio, under act of March 3, 1879.

FOUNDRY is indexed regularly by Engineering Index Inc.
29 West 39th St., New York 18.

ADVERTISING INDEX

Hercules Powder Co. 54
Herman Pneumatic Machine Co. 136, 137
Hickman, Williams & Co. 212
Hines Flask Co., The 124, 125

I

Illinois Testing Laboratories, Inc. 215
Imperial Belting Co. 10
Ingersoll-Rand 69
Injection Molders Supply Co. 263
International Minerals & Chemical Corp., Eastern Clay Products Dept. 165
International Molding Machine Co. 226, 227
International Nickel Co., Inc., The 1
Ironton Fire Brick Co., The 239

J

Jeffrey Mfg. Co., The 8
Johns-Manville 218, 237
Johnston Mfg. Co. 248

K

Kaiser Aluminum & Chemical Sales, Inc. 115
Keller Tool Co. 44
Knight, Lester B., & Associates, Inc. 48
Kuhlman Electric Co., Detroit Electric Furnace Div. 13

L

Lanly Co., The 7
Lindberg Engineering Co., Lindberg-Fisher Div. 142
Lindberg-Fisher, A Div. of Lindberg Engineering Co. 142
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp. 65
Link-Belt Co. 75
Lithium Corp. of America, Inc. 252

M

Macklin Co. 122
Macleod Co., The 249
Magnaflux Corp. 60
Magnet Cove Barium Corp. 19
Markal Co. 255
Master Pneumatic Tool Co., Inc., The 261
Mathews Conveyer Co. 12
Michigan Oven Co. 233
Milwaukee Chaplet & Mfg. Co. 214
Modern Equipment Co. 276
Monsanto Chemical Co., Plastics Div. 45
Mullite Refractories Co., The 249
Murphy, Jas. A., & Co., Inc. 258

N

National Carbon Co., A Div. of Union Carbide & Carbon Corp. 205
National Cylinder Gas Co., The Girdler Co., Div. 63
National Engineering Co. 14, 15
Nelson, Herman, Div., American Air Filter Co., Inc. 256
New York Belting & Packing Co. 190
Newaygo Engineering Co. 130, 131
Newcomb-Detroit 259
Niagara Falls Smelting & Refining Div. 247
Nicholls, Wm. H., Co., Inc. 68
Norton Co. 30, 31, 61, 111

O

Ohio Electric Mfg. Co., The 257
Ohio Ferro-Alloys Corp. 197
Olin Mathieson Chemical Corp., Industrial Chemicals Div. Inside Front Cover
Oliver Machinery Co. 257
Osborn Mfg. Co., The 148, 149

P

Pangborn Corp. 25, 55
Patterson-Kelley Co., Inc., The 38
Penn Iron Works, Inc. 262
Pennsylvania Glass Sand Corp. 117
Pettibone Mulliken Corp., Beardsley & Piper Div. 175, 176, 216, 217
Pittsburgh Coke & Chemical Co. 223
Pittsburgh Crushed Steel Co. 224
Pittsburgh Lectromelt Furnace Corp. 113
Pittsburgh Metals Purifying Co. 6
Planet Corp. 221
Porcelain Products, Inc. 219
Pressed Steel Div., Republic Steel Corp. 42
Pyrometer Instrument Co., Inc., The 246

R

Radium Chemical Co., Inc. 251
Reda Pump Co. 251
Reed Roller Bit Co., Cleco Div. 36
Redford Iron & Equipment Co. 203
Republic Coal & Coke Co. 263
Republic Steel Corp. 9
Republic Steel Corp., Pressed Steel Div. 42
Rice Pump & Machine Co. 258
Ross Operating Valve Co. 141
Rotor Tool Co., The 21
Roura Iron Works, Inc. 211
Royer Foundry & Machne Co. 109

S

Schenectady Resins Div. of Schenectady Varnish Co., Inc. 189
Schneible, Claude B., Co. 32
Schrader's, A., Son, Div. of Scovill Mfg. Co., Inc. 231
Scovill Mfg. Co., Inc., A. Schrader's Son Div. 231
Semet-Solvay Div., Allied Chemical & Dye Corp. 250
Shanafelt Mfg. Co., The 70
Shepard Niles Crane & Hoist Corp. 213
Shell Process, Inc. 145
Sidley, R. W., Inc. 260
Silent Glow Oil Burner Corp., The 72
Silent Hoist & Crane Co. 253
Smillie, C. M., & Co. 246
Smith Oil & Refining Co. 187
Smooth-On Mfg. Co. 263
Solvay Process Div., Allied Chemical & Dye Corp. 198
Sonken-Galamba Corp. 255
SPO, Inc. 162, 163
Stamford Engineering Works 254
Standard Conveyor Co. 178
Standard Electrical Tool Co., The 188
Standard Horse Nail Corp. 254
Stearns Magnetic, Inc. 220
Steel Shot & Grit Co. 224
Sterling Wheelbarrow Co. 76, 248
Stevens, Frederic B., Inc. Inside Back Cover
Swan-Finch Oil Corp. 260
Swindell-Dressler Corp. 57

T

Tabor Mfg. Co., The, Div. of Turbo Machine Co. 40, 41
Tamms Industries, Inc. 258
Technical Operations, Inc. 225
Thiem Products, Inc. 159
Timken Roller Bearing Co., The 52
Toledo Scale Co. 232
Tracerlab, Inc. 262
Turbo Machine Co., The Tabor Mfg. Co. Div. 40, 41

U

Union Carbide & Carbon Corp., Electro Metallurgical Co. 24
Union Carbide & Carbon Corp., Linde Air Products Co. 65
Union Carbide & Carbon Corp., National Carbon Co. 205
Union Wire Rope Corp. 53
United States Steel Corp., American Bridge Div. 49
United States Steel Corp., Subsidiaries 49
Universal Engineering Co. 64

W

Wellman Engineering Co., The 260
Westover Engineers 262
Whitehead Brothers Co. 35
Whiting Corp. 172, 173

Table of Contents, Page 3

Classified Advertisers, 264, 265, 266, 267, 268, 269, 270, 271

For Further Information On Anything Advertised In This Issue, Use One Of The Handy Cards—Page 243

AUTOMATION

The Magazine of Automatic Operations

gateway to the entire automatic operations market

AUTOMATION Magazine covers all phases of automatic production—cuts across all industries. Big now—the rate at which this market is growing—indicates a tremendous growth opportunity for any product or service that can help make operations more automatic. The time to hit this market hard in AUTOMATION is 1955.

needed by the men who are automating their production

They have the green light for full speed ahead on more automatic production to cut costs—raise quality standards. Now they urgently need more information on the fast moving developments in this field—more information on what your product or service can do to help. The high reader interest they have in AUTOMATION Magazine can be documented by hundreds of letters from management, production and engineering executives throughout every industry.

fills the gap in information sources

Busy men charged with the responsibility for revamping their production set-up have wanted one source of authentic information on automatic production. Now this gap has been filled by AUTOMATION Magazine. Concentrating solely on the task of encouraging and helping all industry achieve more automatic production, AUTOMATION has overnight become "must reading" with the very men you want to reach.

quickest way to more sales for:

- Conveying Equipment
- Data Handling Equipment
- Gaging, Testing and Weighing Equipment
- Hydraulic & Pneumatic Controls and Parts
- Handling, Feeding and Indexing Devices
- Instrumentation and Components
- Machine Fixtures, Components and Special Devices
- Motors, Drives and Controls
- Plant and Process Designers and Builders
- Special Machinery and Machine Tools
- Visual and Audible Signal Devices

If you have a product that fits this market, put AUTOMATION Magazine on your '55 schedule to help you get the jump on competition.

this audience across all industry has one common goal—more automatic operations!

For complete information see our new Data File.

SIC NO. AND DESCRIPTION		Total	Copies in Company Name	Corporate Officials and Gen. Mgrs.	Mfg., Production and Processing Mgrs. and Supts.	Engineering Dept. Heads and Design and Plant Engineers	Purchasing, Sales and other Personnel
10-14	Mines	522		44	404	74	
20	Food and Kindred Products	1340	6	210	203	917	4
21	Tobacco Manufacturers	62		10	9	43	
22	Textile Mill Products	965		203	97	664	1
24	Lumber and Wood Products	403		112	66	225	
25	Furniture and Fixtures	181		44	42	95	
26	Paper and Allied Products	734	1	98	126	508	1
27	Printing, Publishing and Allied Industries	179		14	28	134	3
28	Chemicals & Allied Products	1348	9	173	281	884	1
29	Petroleum & Coal Products	427		27	68	332	
30	Rubber Products	211		20	34	157	
31	Leather & Leather Products	213		37	26	150	
32	Stone, Clay & Glass Products	765	1	78	157	529	
33	Primary Metal Industries	1482	6	479	447	545	5
34	Fabricated Metal Products	1547		522	350	672	3
35	Machinery, except Electrical	5187	12	1657	843	2625	50
36	Electrical Machinery, Equipment & Supplies	1950	12	471	381	1056	30
37	Transportation Equipment	1732	26	379	524	791	12
38	Instruments, Optical Goods, Watches & Clocks	605	6	154	116	321	8
39	Miscellaneous Manufacturing Industries	227		41	41	143	2
89	Consulting & Industrial Engineering Firms	937	4	624	6	290	13
	Miscellaneous Industries including Ordnance, Banks, Insurance Companies, Educational, Trade Associations, Libraries, etc.	40	13	9	2	7	9
	TOTAL	21057	96	5406	4251	11162	142
	PERCENTAGE	100.00	0.46	25.67	20.19	53.00	0.68

if your product belongs in automatic operations, your advertising belongs in

AUTOMATION

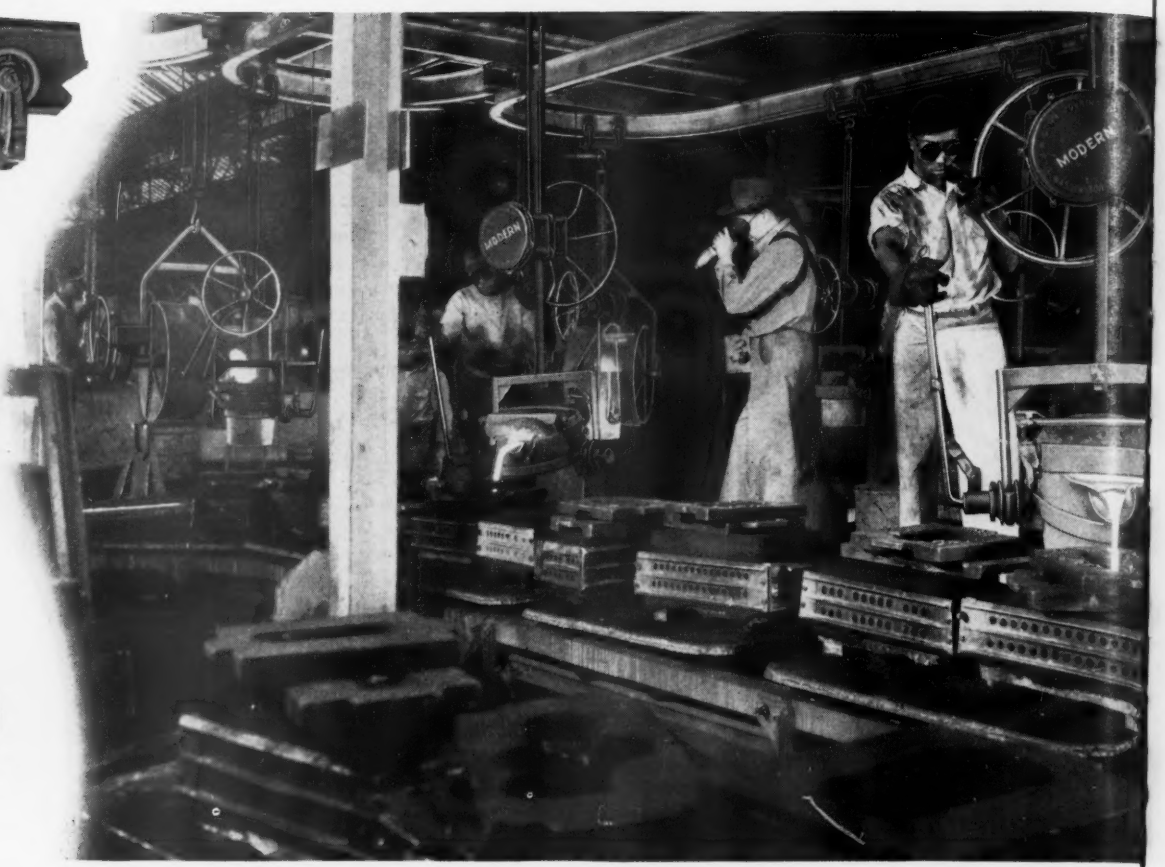
a Penton publication

The magazine of automatic operations

Penton Building, Cleveland 13, Ohio

A LIFT *for your* POUR-OFF-MEN

Rigid, straight-line control from monorail to ladle spout for quick accurate spotting over the sprues.



WORKING TOGETHER WITH PRACTICAL FOUNDRYMEN...

MODERN engineers developed the Pouring Device. That's how our business began!

Today this MODERN one-man-pouring method, as proved in a quarter century's service to foundries, is highly productive — both for the foundry that sets up a floor or two a day, as well as for the large manufacturer* with his most elaborate, double-loop conveyor system.

The MODERN cylindrical ladles, together with their 2000 pound loads of gray iron, are trucked from the cupolas to the pouring floor. In this MODERN equipped operation up to 70 tons of tractor cylinder liners, heads and manifolds are poured in an 8 hour shift. Several of the ladles and the MODERN "FA" Pouring Devices have been in operation since 1938. Herein is a timely story on the effective distribution of manpower. You can read more about it in new catalog P-152: It's free to foundrymen who make request on their company letterheads to—Dept. F-12, MODERN EQUIPMENT COMPANY, Port Washington, Wisconsin.

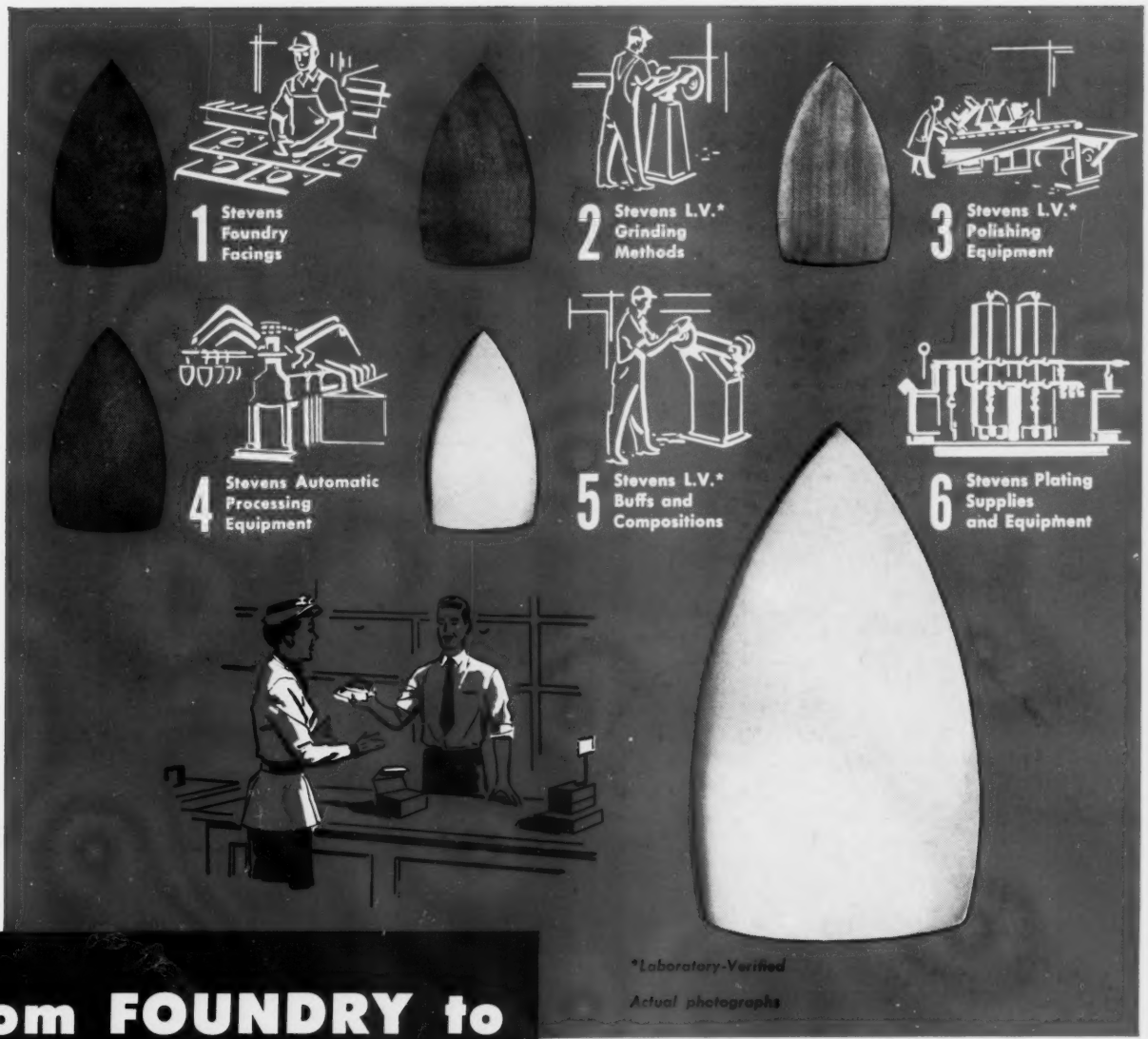
*Allis-Chalmers, Milwaukee

NEW, 50 PAGE CATALOG No. P-152—Ladles and Pouring Devices

MODERN EQUIPMENT CO.
PORT WASHINGTON, WISCONSIN

OTHER FREE CATALOGS

Cupolas and Chargers	*No. 147-A*
Front Slagging	*No. S-6-54*
Monorails, Cranes, Switches	*No. 150*


1 Stevens Foundry Facings
2 Stevens L.V.* Grinding Methods
3 Stevens L.V.* Polishing Equipment
4 Stevens Automatic Processing Equipment
5 Stevens L.V.* Buffs and Compositions
6 Stevens Plating Supplies and Equipment
*Laboratory-Verified
Actual photographs

from FOUNDRY to FINISHED PRODUCT . . . shop at Stevens

In America's modern marketing economy, the supermarket stands as a symbol of efficiency – offering the most convenient manner of buying quality products at competitive cost. Purchasors in the foundry and metal finishing fields are recognizing that one-source "shopping" at Stevens offers them these same advantages. Whether your product is stamped, cast, forged or molded – you can save time and money and produce a better surface finish by seeing Stevens for *all* your equipment and supplies. Not only are you assured quality products at a competitive price but, because Stevens understands your *complete* needs, you benefit from integration of materials to meet your particular requirements. For everything from foundry facings to full automatic plating machines, do as the iron manufacturer above has done – investigate the value of one-source "shopping" at Stevens. Call your Stevens representative or write direct.

FREDERIC B. STEVENS, INC., Detroit 16, Michigan.

FREDERIC B.
STEVENS
INCORPORATED
EVERYTHING FOR A FOUNDRY
DETROIT 16, MICHIGAN

BRANCHES: BUFFALO • CLEVELAND • INDIANAPOLIS
NEW HAVEN • DAYTON

IN CANADA: FREDERIC B. STEVENS OF CANADA LTD.,
TORONTO • WINDSOR

Basic Layout is important!

BARTLETT-SNOW foundry layouts — conceived and developed by engineers with extensive training and specialized foundry experience — coordinate all departmental functions into a synchronized, efficient, low cost operation.

● Pioneers in applying mechanization to the foundry industry, Bartlett-Snow layouts are "tailor made" for your individual requirements, to obtain adequate working areas, free access to machines and materials and economical arrangement of equipment thus assuring maximum output per worker, per unit of floor area and per dollar invested. Many outstanding installations. Let us work out the solution to **your** problems.

DESIGNERS
ENGINEERS

BARTLETT-SNOW
CLEVELAND 5, OHIO

FABRICATORS
ERECTORS

Foundrymen Who Know — Buy Bartlett-Snow

TECHNOLOGY DEPT.

PUBLIC LIBRARY
FEB 12 1954
DETROIT

FOUNDRY

Index

Volume 82

1954

The Penton Publishing Company
Penton Building
Cleveland 13, Ohio

Index—January-December, 1954

	Issue	Page
A		
ABC of Foundry Practice: Jan. 168; Feb. 220; Mar. 237; Apr. 226; May 384; June 220; Aug. 224; Nov. 209		
Abbeon Supply Co. Offers Inspection Light	Aug.	206
Abolite Lighting Division Offers Yard Light	Jan.	227
Abrasive Facing on Door Sills, Wants (Q & A)	Sept.	127
Abrasive Grain for Blasting, Offers	Nov.	242
Abrasive, Offers Open-Mesh	May	412
Abrasive Products Co. Offers Tumbling Grain	Nov.	242
Accident Statistics, Human Side of	Feb.	106
Acheson Colloids Co. Offers Coating	Sept.	256
Acid Electric Steelmaking, Chemistry of	Oct.	120
Acme Resin Corp. Offers Shell Molding Process	Mar.	294
Acmor Conveyor Chain Co. Offers Hollow Pin Unit	May	444
Acromark Co. Developes Type Holder	Sept.	254
Adapter End Bell, Announces Motor	May	442
Adhesive, Develops Industrial Solvent	May	394
Adhesive, Offers Liquid Anti-Acid	Feb.	226
Aging of Castings, Discusses (Q & A)	Aug.	99
Air Circulator, Announces	Aug.	207
Air Conditioner, Develops Cab	Jan.	222
Air Contamination, Closed-Top Cupolas End	Dec.	86
Air Equipment Corp. Offers Pencil Grinder	Nov.	246
Air Hammer Tools, Announces	Mar.	280
Air Line Attachment, Announces	July	216
Air Line Attachment, Offers	Apr.	246
Airmatic Valve Inc. Offers Control Valve	Nov.	248
Air-Mite Offers Air Line Unit	July	216
Air Moves the Sand at Allis-Chalmers	Feb.	96
Air Pollution Control Association Plans Meeting	Mar.	314
Air Reduction Sales Co.		
Process for Welding Copper, Develops	Sept.	165
Regulator, Develops Pipeline	May	420
Welding Accessories, Announces	June	266
Welding Film, Develops	Feb.	264
Aircraft Castings, Testing	Mar.	110
AiResearch Mfg. Co., Precision Casting at	Apr.	124
Airlenco Inc. Offers Air Line Filter	Aug.	201
Ajax Electric Co. Develops Salt Bath Test (FD)	Mar.	158
Ajax Engineering Corp. Builds 1000th Furnace	July	180
Alabama By-Products Corp. Makes Personnel Changes	July	244
Alarm, Announces Gas	Sept.	258
Alarm System, Offers Magnet	Apr.	250
Albion Malleable Iron Co.		
Casting Operations, Films	Sept.	171
Malleable Founders' Society Visits	Nov.	232
Scoutorama, Sponsors	Sept.	197
All-State Welding Alloys Co. Offers Steel Electrode	Apr.	238
All-State Welding Alloys Co. Offers Welding Alloy	Feb.	238
Allied Witan Co. Offers Exhaust Muffler	Sept.	251
Allis, Louis, Co. Offers Electric Motor	Feb.	235
Allis, Louis, Co. Offers Speed Drive	May	432
Allis-Chalmers Mfg. Co.		
Air Moves the Sand at	Feb.	96
Buda Division Develops Fork Lift Attachment	Nov.	246
Induction Motor, Develops	May	436
Overhead Handling Increases Production at	Nov.	221
Alloy Casting Institute		
Alloy Data Sheets, Publishes	Nov.	158
Nickel Alloy Research, Sponsors	Mar.	255
Nickel-Chromium List, Revises	July	240
Officers, Elects	Aug.	168
Alloy Designation System, Develops (FD)	Oct.	176
Alloy Engineering & Casting Co. Advances Ceramic Mold Techniques (FD)	Mar. 158; Apr.	206
Alloy Gray Iron, Cost of	Mar.	122
Alloy Iron Castings, Making (Q & A)	July	110
Alloy Iron, Wants Information on (Q & A)	Sept.	127
Alloy Rods Co. Designs Bronze Electrode	Sept.	260
Aluminum Alloys		
Effect of Melting Frequency on	Aug.	84
For Pattern Work (Q & A)	Apr.	134
Hard Coating for (FD)	Sept.	160
Properties of ML (FD)	Aug.	181
Aluminum Association Develops Alloy Designations (FD)	Oct.	176
Aluminum Association Elects Officers	Mar.	212
Aluminum Base Alloy Castings, Test Bars for	June 96; July	100
Aluminum Casting Operation, Equipment for (Q & A)	Sept.	126
Aluminum Castings, Gas Porosity in	Aug.	176
Aluminum Co. of America		
Electrode, Announces Consumable	Nov.	244
Mobile Works, Expands	Mar.	162
Research Work Booklet, Publishes	July	243
Roofing, Offers Corrugated	May	408
Straddle Truck, Acquires Huge	Dec.	150
Welding Manual, Publishes	Aug.	138
Aluminum, Determination of Carbon in (FD)	Feb.	164
Aluminum Foundry, Use of Molding Sand in the	Nov.	134
Aluminum Pig Alloy, Announces	Oct.	240
Aluminum Sand Castings, Accuracy in Making	Jan.	92
Aluminum Slab for Heat Transfer Medium (Q & A)	June	124
American Air Filter Co.		
Air Heater, Announces	Nov.	250
Air Heater, Redesigns	Jan.	227
Dust Collector, Announces	Apr.	230
Ventilation Unit, Announces	Sept.	254
American Blower Corp. Offers Unit Heater	Sept.	251
American Brake Shoe Co., Cartoon Safety Contest at	Oct.	169
American Brake Shoe Co., Job Placement Examination at	Sept.	124
American Cleaning Equipment Corp. Offers Vacuum Cleaner	Feb.	226
American Cool-air Corp. Offers Circulator	Aug.	207
American Die Casting Institute, Doehler Award of	Mar.	303
American Die Casting Institute Holds Annual Meeting	Oct.	217
American Engineering Co. Offers Electric Hoist	Nov.	257
American Foundrymen's Society		
Cleveland Convention Committees and Program	Jan.	194
Convention, Cleveland Is Host to 1954	May	112
Convention Committee Meetings, Cleveland	May	114
Convention Program, 1954	May	116
Convention Reports, 1954	June 136; July	134
Convention Reveals Future Trends	June	86
Cupola Handbook, Publishes	Nov.	167
Foundry Show, Announces 1956	Aug.	33
Foundry Show Exhibitors, Announces 1954	May	122
Foundry Show Features New Equipment June 92; July 124; Aug.		118
Hoyt Annual Lecture, AFS	May 113; June	90
Ladies' Program, Convention	May	115
Medalists, Announces 1954	May	126
Molding Machine Symposium, Publishes	July	174
New Headquarters, Dedicates	Dec.	33
Northeastern Ohio Chapter Convention Committees	May	128
Officers and Directors, Announces	Feb. 134; June	86
Plant Visitations, Cleveland Convention	May	131
Program of 1955 Convention, Tentative	Nov.	234
Regional Conference, Holds East Coast	May	304
Regional Conference, Northwest Chapters Hold	Jan.	162
Regional Conference, Southeast Chapters Hold	Apr.	167
Regional Conference, Wisconsin Chapter Holds	Apr.	153
Transactions, Issues Index of (1941-50)	Aug.	223
American Industrial Hygiene Association To Meet	Apr.	33
American Industrial Safety Equipment Co. Offers Goggles	Feb.	226
American Institute of Management Announces Awards	Mar.	221
American Institute of Management Issues Manual	May	390
American Institute of Mining and Metallurgical Engineers Holds Electric Furnace Steel Conference	Jan.	128
American-LaFrance-Foamite Corp. Offers Cart	Nov.	247
American-LaFrance-Foamite Corp. Offers Fire Extinguisher	Mar.	295
American Management Association		
Financial Management Booklets, Issues	Sept.	148
Human Relations and Cost Bulletins, Issues	Sept.	162
Management Booklets, Issues	May	240
Management Education Study, Completes	July	251
Manufacturing Bulletins, Issues	Sept.	197
Personnel Booklet, Announces	Mar.	310
American Material Handling Society Officers	Dec.	179
American Metal Products Co. Offers Folding Rack	Mar.	289
American Metaseal Mfg. Corp., Impregnation Research at	Feb.	248
American Metaseal Mfg. Corp. Offers Packaged System	Jan.	215
American MonoRail Co. Appoints Distributor	Feb.	160
American MonoRail Co. Designs Roll-Over Carrier	Sept.	260
American Optical Co. Offers Respirator Filter	Sept.	249
American Silica Sand Co. Installs Rotary Drum Drier	June	218
American Society for Metals		
Metal Congress, Sponsors 1954	Sept.	162
Officers, Announces 1954	Oct.	162
Survey of Metallurgical Engineers, Conducts	Sept.	162
Teachers' Metal Technology Course, Offers	Jan.	212
American Society for Testing Materials		
Annual Meeting, Holds	Aug.	128
Annual Meeting, Plans 57th	Apr. 224; June	155
Directory of Laboratories, Publishes	July	178
Index to ASTM Standards, Publishes	June	235
Stainless Filler Metals, Lists	July	245
Welding Electrodes Specifications, Issues	June	206
American Standards Association Revises Color Code	May	254
American Steel & Wire Division Adds Blast Furnace	Feb.	138
American Steel & Wire Division Lights Huge Furnace	Nov.	172
American Steel Foundries Mothballs Cast Armor Plant	Oct.	194
American Welding Society		
Electrodes Specifications, Issues	June	206
Repair of Cast Iron Pipe, Describes	Sept.	280
Spring Meeting and Show, Plans	Mar. 162; May	348
American Wheelabrator & Equipment Corp.		
Blast Cleaner, Announces	Dec.	206
Blast Unit, Develops Fast	Sept.	210
Drum Cleaning Machine, Offers	Aug.	196
Scholarships, Sponsors	June	206
Steel Shot, Announces	Jan.	215
Amplex Corp. Offers Reflector Lamp	Mar.	288
Analytical Measurements Inc. Offers Meter	Oct.	240
Anderson, V. D., Co. Offers Moisture Trap	Nov.	238
Anderson, V. D., Co. Offers Purifier	Oct.	250
Annealing Improves Gray Iron Machinability	Jan.	110
Apprenticeship		
Labor Department Evaluates	Feb.	142
Labor Department Extends Survey on	June	156
Labor Department-Federal Committee on	Jan.	34
Apprenticeship Conference, Plans Eastern	Apr.	33
Arcair Co. Announces Cutting Torch	Apr.	238
Armour Research Foundation Develops New X-ray Source (FD)	Mar.	158
Armour Research Foundation Studies Ceramic Coatings (FD)	Oct.	176
Around the Country: Jan. 158; Feb. 141; Mar. 160; Apr. 184; May 238; June 156; July 172; Aug. 141; Sept. 173; Oct. 159; Nov. 206; Dec. 191		
Arsenic Addition to Copper (Q & A)	Aug.	100
Asbestos Yarn Solves Coring Problem	Feb.	167
Assembly Products Inc. Offers Pyrometer	June	270
Atlantic Foundry Co., Core Blowing at	Mar.	304
Atlas Industries Inc. Offers Loading Shelter	Feb.	238
Atlas Welding Accessories Co. Offers Chipping Hammer	Apr.	245
Auburn Foundry Inc., Mechanized Operation at	July	78
Auburn Foundry Inc., Metal Handling at	July	82
Austin-Western Co. Announces Hydraulic Crane	Jan.	224
Auto Specialties Mfg. Co. Casts Artillery Shells	July	96

EDITOR'S NOTE—Abbreviations appearing in this index refer to the following editorial departments:

ED—Editorial **Q & A—Questions and Answers** **FD—Foundry Developments**

	Issue	Page
Auto Specialties Mfg. Co. Designs Furnace Scaffold	Mar.	142
Automatic Transportation Co. Offers Dumper	Jan.	234
Automation in the Foundry	May	140

B

B & E Mfg. Co. Offers Wheel Belt Grinder	Nov.	252
Bader, Stephen, & Co. Offers Polishing Machine	Aug.	204
Baird Associates Inc. Offers Spectrometer	Dec.	219
Bakelite Co.		
Ice-Crushing Machine, Reduces Cost of (FD)	Oct.	176
Precoating Process, Announces	Sept.	244
Resin Matchplate, Offers	July	220
Baker-Lull Corp. Announces End Loader	Mar.	281
Baker-Lull Corp. Offers End Loader	Feb.	224
Baker-Raulang Co.		
Truck, Announces Two-Speed Lift	Nov.	255
Truck, Develops Foot-Operated Lift	Apr.	240
Truck, Offers Gas-Powered Lift	Dec.	218
Baldwin-Lima-Hamilton Corp.		
Crane Scales, Offers	Dec.	211
Light Alloy, Develops (FD)	Dec.	156
Runner, Builds Giant Turbine	Nov.	172
Ball Bearing Unit, Announces Positive Lock	Jan.	216
Ball Bearing Unit, Offers Light Duty	Apr.	249
Band Filing Reduces Foundry Costs	Mar.	108
Band Machine, Announces	Oct.	241
Barber-Green Co.		
Conveyor, Announces Belt	Nov.	252
Drier, Announces Rotary Drum	June	218
First Aid Unit, Designs	Sept.	210
Barrel, Announces Cleaning	Sept.	245
Barrel Finishing Chips, Announces	Apr.	230
Bassick Co. Announces Shock Absorbing Caster	May	393
Bathtubs, Studies Cause of Cracking in (FD)	July	132
Battelle Memorial Institute Acquires Land	Nov.	228
Battery		
For Industrial Truck, Offers Storage	Sept.	260
For Lift Truck, Designs	May	410
For Walkie Powered Lift Truck, Offers	Nov.	254
Long-Life Storage, Develops	Aug.	202
Battery Cell Puller, Announces	Jan.	228
Beacon Machinery Inc. Offers Pallet Stacker	Dec.	211
Beardsley & Piper Division		
Core Machine, Announces	Nov.	237
Molding Machine Clamp, Offers	Feb.	233
Riddle for Molding Machine, Offers	Oct.	241
Shell Investment Unit, Offers	Dec.	206
Shell Mold Equipment, Announces	Jan.	214
Steel Liner, Develops	Sept.	260
Timer, Offers Mulling Cycle	Oct.	254
Bearings, Announces Heavy-Duty Roller	June	265
Belt Conveyor Carrier, Announces	Sept.	254
Belt Fastener, Offers	May	440
Belting		
Device Protects Elevator	Apr.	201
Heat-Resistant, Announces	Feb.	234
Heavily Coated Abrasive, Offers	Jan.	214
Hot Material Conveyor, Offers	May	404
Installation and Maintenance of Conveyor	Feb.	86
Open-Link Conveyor, Designs	Oct.	247
Rayon Conveyor, Announces	Apr.	242
Bench, Announces Power Tool	Jan.	222
Berliet Foundries Employ Modern Methods	Dec.	90
Beryllium Corp. Announces High Strength Alloy	Jan.	216
Beryllium Corp. Offers Nonberyllium Alloys	Feb.	259
Beryllium Products, Announces	Jan.	216
Besly-Welles Corp. Announces Tool Bit	Jan.	224
Bethlehem Steel Co. Casts Lincoln Tunnel Segments	Feb.	144
Bettinger Corp. Develops Ceramic Coating (FD)	Nov.	230
Big Joe Mfg. Co. Announces Telescopic Lift	Sept.	249
Big Joe Mfg. Co. Offers Lift Truck	Apr.	240
Biggs, Carl H., Co. Offers Repair Compound	Oct.	240
Bill, Adventures of	Jan. 196; Feb.	200
Bimetallic Castings by Bonding Process	Sept.	102
Birmingham Chapter of the AFS		
Panel Discussions, Holds	Dec.	181
Pattern Engineering, Considers	Mar.	268
Southeastern Regional Conference, Plans	Jan.	191
Bit, Announces High-Speed Steel Tool	Jan.	224
Blade, Announces Masonry Cutting	June	272
Blast Cleaner, Announces	Dec.	206
Blaw-Knox Co. Casts Tank Parts	Mar.	144
Blaw-Knox Co. Modernizes Rolls Department	Mar.	246
Blow, Sand Pocket Causes Blow (Q & A)	Aug.	98
Blower		
Automatic Cutout, Develops	Feb.	247
Large Volume Centrifugal, Offers	Oct.	248
Turbo-Pressure, Announces	Nov.	250
Vaneaxial, Announces	Jan.	222
Blowing Machine Makes Molds and Cores	May	351
Blue M Electric Co. Offers Indicator	May	406
Bohn Aluminum & Brass Corp. Honors Employees	Feb.	139
Bohn Aluminum & Brass Corp. Wins Foundation Award	July	164
Boiler, Offers Self-Contained Heating	July	220
Bonded Molding Sand, Naturally	Nov.	112
Book Review:		
ASTM Standards—Electric Materials	Oct.	239
ASTM Standards—Ferrous Metals	Sept.	280
ASTM Standards—Fuels, Petroleum, Aromatic Hydrocarbons, Engine Antifreezes	May	322
ASTM Standards—Nonferrous Metals	May	245
ASTM Standards—Paint, Naval Stores, Wood, Sandwich and Building Constructions, etc.	May	260
ASTM Standards—Textiles, Soap, Water, Paper, Adhesives, Shipping Containers	May	264
Brief History of the Foundry (Italian)	Mar.	221
British Manufacturers, FBI Register of	Jan.	152
Characteristics and Applications of Resistance Strain Gages	Sept.	175
Comprehensive Treatise on Foundry Technique (German)	Mar.	302
Control of Quality in Melting and Casting	Feb.	142
Defects in Casting (German)	Mar.	238
Densening and Chilling in Foundry Work	May	301
Elevated-Temperature Properties of Chromium-Molybdenum Steels Report	Apr.	181
English-French Industrial Heating Dictionary	Mar.	216
Ferrous Process Metallurgy	May	222
Induction and Dielectric Heating	May	336
Lubrication—Industrial and Marine Machinery	Oct.	268
Materials and Processes	Apr.	256
Mechanics of Materials	May	360
Metal Statistics—1954 Edition	Sept.	215
Metallurgical Dictionary	Jan.	148
Modern Electroplating	May	366
Molding Sand and Molding Materials (German)	Mar.	140
Nonferrous Foundry Metallurgy	July	237
Pay Almanac, 1954	Mar.	303
Plastic Engineering Handbook	Dec.	193
Procedures in Experimental Metallurgy	Jan.	140
Protective Atmospheres	Jan.	253
Rolling Mills, Rolls and Roll Making	Apr.	229
Tax Planning for Foundations and Charities	Jan.	161
Titanium and Titanium Alloys	Oct.	225
Transactions of the AFS, 1953	Feb.	198
Borings, Tries Cupola Melting of (Q & A)	Mar.	128
Botsford Chemical Co. Announces Detector	Nov.	237
Box		
Corrugated Skid, Offers	Dec.	206
Drop Bottom, Develops	Oct.	240
Hopper Dump, Announces	Nov.	237
Materials Handling, Offers	Nov.	243
Nesting Stacking, Develops	Aug.	196
Stacking Pallet, Offers	Nov.	249
Steel Frame Shipping, Announces	Dec.	219
Bradley, David, Mfg. Works Develops Tractor	Jan.	158
Brady, W. H., Co. Offers Warning Signal	Aug.	197
Brake, Announces Rectifier	Nov.	246
Brake, Develops Disk	July	216
Brake Shoe Plant, One-Man Foundry Competes with	Mar.	241
Brass Castings		
Cause of Sponginess in (Q & A)	Oct.	135
Difficulties in Tumbling of (Q & A)	Dec.	108
How To Color (Q & A)	Sept.	130
Ingot Causes Trouble in (Q & A)	July	107
Nickel Addition Eliminates Leakers in (FD)	June	160
Sand Causes Defects in (Q & A)	Dec.	106
Brass Fittings, Would Improve Finish on (Q & A)	June	122
Brass Foundry, Molding Sand in the	Nov.	130
Brass Foundry, Solving Problems in the	Sept. 106; Oct.	130
Breco Mfg. Co. Offers Air Line Attachment	Apr.	246
Bridle, Announces Sling	Dec.	207
Bristol Co. Develops Thermocouple Well	Mar.	280
Bristol Co. Offers pH Controller	Nov.	250
British Cast Iron Research Association Develops Furnace (FD)	July	132
British Foundry Education	July	92
British Foundry Research	Mar.	112
British Pattern Society, Organizes	Aug.	166
British Productivity Teams Conclude Reports	Nov.	34
British Steel Castings Research Association Elects	Feb.	198
British Supply Directory, Publishes	Nov.	232
Bronze Castings, Tin Sweat Forms Skin on (Q & A)	July	108
Bronze Plaques, Casting and Finishing	Oct.	166
Bronze Tablet Molds Are Skin Dried (Q & A)	Jan.	116
Broom, Announces Push	June	277
Brush Drive Assembly Plan, Offers Conveyor	Feb.	225
Bucket Trolley, Announces Multiplane	July	208
Buckeye Tools Corp. Dedicates New Plant	Nov.	172
Buehler Ltd. Offers Polishing Table	Apr.	250
Building, Offers Materials for Constructing	May	436
Bullard, E. D., Co. Designs Face Shield	Sept.	259
Burgess-Manning Co.		
Silencer, Announces Exhaust	May	430
Silencer for Air Machines, Offers	Feb.	230
Telephone Booth, Announces	July	222
Burgess-Sterbentz Corp.		
Refractories Gun, Offers	Apr.	232
Vibrator, Announces Pneumatic	Oct.	245
Vibrator for Bulk Materials, Offers	Mar.	290
Burner		
Air Type Oil, Announces	May	402
For All Types of Furnaces, Develops	Nov.	241
For High Temperature Furnace, Announces	June	274
For Pull-through Air Heater, Offers Packaged	May	418
Radiant Tube, Announces	Jan.	219
With Manual or Automatic Control, Offers	Mar.	281
Buschman, E. W., Co. Offers Cable Conveyor	May	434
Buschman, E. W., Co. Offers Conveyor Roller	Nov.	249
Bushings, Core Mix for Bronze (Q & A)	Feb.	116
Bushings Develop Cracks when Machined, Brass (Q & A)	Aug.	102
Buying Castings vs Casting Buying	June	102

C

Cab, Designs Detachable Tractor	May	412
Cabinet, Offers Storage	May	420
Calcium Boride Compound, Use of (Q & A)	Jan.	115
Calcium Boride, Reports Wide Use of (FD)	Nov.	236
California Regional Foundry Conference, Plans	Dec.	240
Callander Foundry-Rockwell Co. Merger	Jan.	134
Campbell Detachable Cab Co. Offers Operator Cab	May	412
Campbell, Wyant & Cannon Foundry Co., Metal Analysis at	Sept.	112
Canadian AFS Foundry Conference, Holds	Dec.	202
Canadian Car & Foundry Co. Modernizes Plant	Sept.	146
Canadian Foundry Conference, Plans	Sept.	232
Canadian Foundry Supplies & Equipment Co. Wins Contest	Mar.	251
Canton Chapter of the AFS Studies Welding Advances	Mar.	266
Canton Chapter of the AFS Views Sand Film	Apr.	212
Canton Products Develops Pattern Letters	Oct.	240
Cap, Announces Paper Work	Feb.	245
Capewell Mfg. Co. Develops Pipe Wrench	Jan.	231
Car Puller, Announces	Dec.	215
Carbon Deposits on Brass Fittings, Questions (Q & A)	Oct.	134
Carbon Determination, Develops Method for (FD)	Feb.	164
Carborundum Co., The		
Abrasive, Announces Open-Mesh	May	412
Back Stand Idler, Offers	June	266
Grinding Wheels, Announces	Feb.	244
Traveling Workshop, Builds	Jan.	135
Carpenter Mfg. Co. Offers Emergency Light	July	218
Carrier, Develops Roll-Over	Sept.	260
Cartoons:		
Blakley, Tom:	Jan.	260
Bloodworth, Alvin H.:	Sept. 206; Nov. 266; Dec.	242

	Issue	Page
Dilts, Joe: ..... July 148, 150; Sept. 191; Nov.		271
Glueckstein, Robert W.: ..... Sept. 242; Nov.		263
Hawver, Wilbert: ..... July 165; Sept.		270
Hopkins, Curtis: ..... Jan. 257; July 154; Sept.		169
Tharp, William G.: Jan. 130; Feb. 184, 190, 195; Mar. 147; Apr. 188, 191, 196, 278; June 176; Oct. 238; Dec. 249		
Case Institute of Technology Plans Conference	Apr.	265
Cast Iron Sheets, Continuous Rolling of (FD)	Feb.	164
Cast Iron Soil Pipe Institute		
New President, Installs	Feb.	142
Rigid Quality Standards, Establishes	Oct.	159
Seal of Quality to Commerce Dept., Presents	Oct.	230
Cast-Master Inc. Offers Pressure Intensifier	Dec.	208
Caster, Offers Shock Absorbing	May	393
Cast-Weld Construction	Mar.	114
Casting Buying vs Buying Castings	June	102
Casting Defects, Causes and Remedies of	Feb.	113
Casting Repair	Nov.	209
Casting Shipments by Months: Jan. 143; Feb. 147; Mar. 155; Apr. 159; May 249; June 165; July 157; Aug. 131; Sept. 237; Oct. 233; Nov. 177; Dec. 195		
Casting Weight Formulas (Data Sheet) VII: Jan. 173; Feb. 175; Mar. 207		
Castings, Let's Talk (Ed)	Aug.	69
Castings Service Inc. Offers Corebox Machine	Aug.	197
Casualty & Surety Companies Issue Handbook	Nov.	272
Caterpillar Tractor Co. Enjoys Safest Year	Apr.	175
Cauhorn Distributing Co. Offers Heater	Jan.	232
Cellophane Covers Protect Mold Cavities	Feb.	167
Cement for Electric Induction Furnace, Develops (FD)....	Aug.	181
Cement, Offers Insulating	May	404
Cementite During Solidification, Decomposition of (FD) ..	July	132
Central Illinois Chapter of the AFS		
Fish Fry, Holds Annual	Nov.	182
Management Problems, Studies	Dec.	184
Officers, Elects	Aug.	184
Central Indiana Chapter of the AFS Holds Conference ..	Dec.	238
Central Indiana Chapter of the AFS Plans Conference	Oct.	217
Central Michigan Chapter of the AFS		
Albion Malleable Iron Co. Film, Views	Nov.	192
Coremaking Film, Views	Apr.	210
Foundry Costs, Considers	May	380
Gating Practice, Considers	Dec.	188
Officers, Elects	July	201
Program Schedule, Announces	Feb.	218
Youth Encouragement Night, Holds	Jan.	191
Central New York Chapter of the AFS		
Cupola Operation, Considers	Nov.	198
D-Process for Shell Molding, Studies	May	374
High Pressure Molding, Considers	Dec.	182
Round-table Discussions, Holds	Mar.	262
Slag as a Refractory, Considers	Jan.	182
Central Ohio Chapter of the AFS Studies Good Castings..	Dec.	182
Centrifugal Casting Co. Offers Shell Mold Machine	Aug.	197
Centrifugal Casting of Sleeve Bearings	Dec.	102
Centrifugal Force Filters Molten Metals (FD)	May	236
Ceramic Mold Techniques, Advances (FD) ..... Mar. 158;	Apr.	206
Cesium 137 Applied to Industrial Radiography (FD)	May	236
Chain, Announces Conveyor	May	444
Chain Belt Co. Receives Safety Award	July	180
Chambersburg Engineering Co.		
Core without Box, Makes	Sept.	148
Hammer, Offers Air Operated Drop	Dec.	218
Huge Castings, Makes	June	162
One-Piece Casting for Cylinder Block, Pours	July	192
Charging System, Installs Skip	Oct.	248
Chemical Development Corp. Offers Plastic Metal	May	418
Chemistry of Acid Electric Steelmaking	Oct.	120
Chesapeake Chapter of the AFS		
Bethlehem Steel Co., Visits	Dec.	188
East Coast Conference, Sponsors	May	304
Foundry Problems, Holds Panel on	Feb.	206
Inspection Methods, Considers	June	236
Chicago Blower Corp. Offers Pressure Blower	Nov.	250
Chicago Chapter of the AFS		
Annual Stag Outing, Holds	Sept.	232
Feeding Range of Risers, Studies	Mar.	274
Kennedy Scholarship, Announces First Annual	Dec.	191
Kennedy Scholarship Fund, Starts Robert	Mar.	252
Molding Processes, Studies	Apr.	208
Officers, Elects	June	236
Quality Control, Considers Foundry	Nov.	182
Round-table Discussions, Holds	Dec.	184
Round-table Meeting, Holds Technical	Feb.	214
Round-table Sessions, Holds	Jan.	185
Chicago Eye Shield Co.		
Goggles, Offers Lightweight Plastic	Oct.	253
Respirator, Announces	Feb.	236
Tip Temples for Goggles, Offers	Mar.	286
Chicago Forging & Mfg. Co. Offers Battery	May	410
Chicago Foundrymen's Association Elects Officers	Jan.	152
Chicago Foundrymen's Association Honors Old Members ..	Aug.	138
Chicago Wheel & Mfg. Co. Offers Novaculite Chips	Apr.	230
Chill Test Procedure, Suggests (Q & A)	Nov.	142
Chill Testing Cast Iron, Method of (Data Sheet)	May	273
Chilled Areas Appear in Gray Iron Casting (Q & A)	Apr.	130
Chilling Causes Trouble in Iron Castings (Q & A)	Jan.	115
Chills		
And Mottle Formation, Temperature Affects (FD)	June	160
Casting Gears in (Q & A)	Oct.	135
Radius Spider, Announces	May	392
Christmas Seals, Buy	Dec.	177
Chrysler Corp.		
Lightweight Castings in Sedans, Uses	Jan.	134
Liquid Adhesive, Announces Industrial	Feb.	226
Television Controls Loading Operations at	Feb.	188
Cincinnati Grinding Wheel Co. Expands Plant	Sept.	219
Clamp		
Molding Machine, Develops	Feb.	233
Plunger Type Toggle, Announces	Feb.	247
Pressure C, Offers	May	400
Clark Bros. Builds Turbo-Charged Gas-Engine	July	192
Clark Controller Co. Designs Electrode Control Units	May	325
Clark, David, Co., Offers Ear Protector	July	218
Clark Equipment Co.		
Assembly Plant, Plans new	Apr.	272
Automatic Drive, Announces	May	430
Lift Truck, Announces LPG Fork	Nov.	238
Mobile Service School, Develops	Feb.	139
Towing Tractor, Announces	June	277
Tractor Shovel, Develops	Jan.	224
Cleaner, Announces Noncorrosive Ferrous Metal	Mar.	280
Cleaner, Offers Alkaline Type Metal	June	264
Cleaning		
And Shakeout, Small Equipment for	May	186
Castings by Tumbling	Oct.	236
Devices for Holding Castings during	Sept.	276
Equipment for Finishing and	May	158
Cleaning Room Bottleneck, Ends	Dec.	94
Cleaning Room, Grinding Operations in the .... May 384;	June	220
Cleaver-Brooks Co. Offers Boiler	July	220
Cleco Division Offers Die Grinder	May	400
Clementina Ltd. Announces Deadman Valve	Mar.	287
Cleveland Is Host to AFS Convention	May	112
Cleveland Process Co. Offers Radiant Heater	Feb.	230
Cleveland Vibrator Co. Announces Air Vibrator	Oct.	246
Cleveland Vibrator Co. Offers Air Vibrator	Jan.	220
Climax Molybdenum Co. Hits Record Production	Mar.	242
Climax Molybdenum Co. Issues Alloy Steel Book	June	192
Close-Tolerance Castings, Specializes in	Apr.	124
Cloth, Develops Chemically Treated	Sept.	254
Clothing, Announces Asbestos	Nov.	248
Clothing, Offers Protective	Nov.	254
Clyde Iron Works Announces Car Puller	Dec.	215
Coating		
Aluminum-Asbestos Roof, Offers	Oct.	247
Corrosion Protection, Offers	Nov.	256
Dry-Film, Announces	Sept.	256
For Aluminum Alloys, Studies Hard (FD)	Sept.	160
For Cores and Molds, Offers	Nov.	237
For Foundry Applications, Develops Ceramic (FD)	Oct.	176
For Patterns, Announces	Mar.	295
High-Temperature Ceramic, Develops (FD)	Nov.	230
Non-Skid Plastic, Offers	May	444
Skid-Proof Floor, Announces	May	438
Zinc-Base, Announces	May	392
Zinc Resin Vehicle, Announces	Nov.	237
Coffing Hoist Co. Offers Safety Hook	Sept.	257
Coke Brecze for Cupola Fuel, Preparing (FD)	June	160
Coke, To Build Bin for Storage of (Q & A)	Nov.	140
Coke Production and Consumption: Jan. 144; Feb. 148; Apr. 160; May 250; June 166; July 158; Aug. 132; Oct. 234; Nov. 178; Dec. 196	Mar.	156; Sept. 238;
Cold Cracks in White Iron	Apr.	122
Cold Shuts Occur in Brass Castings (Q & A)	Nov.	141
Coleman Instruments Inc. Offers pH Meter	July	220
Coleman, William B., Scholarship, Establishes	Dec.	168
Coles Cranes Inc. Offers Mobile Crane	Dec.	219
Colonial Refining & Chemical Co. Announces Coating	Oct.	247
Colonial Refining & Chemical Co. Offers Nonskid Paint	Jan.	219
Columbian Vise & Mfg. Co. Offers Vise	Feb.	246
Combustion Control Corp. Offers Fuel Control	Jan.	227
Common Sense in Cores	July	84
Comparator, Develops Thermoelectric Metal (FD)	Apr.	206
Compressed Air Removes Core Stick	July	189
Compressor, Announces Heavy Duty Air	Sept.	245
Conestoga Foundrymen's Association Meets	Dec.	186
Coneygre Foundry Ltd. Issues History of English Foundry..	Oct.	183
Connecticut Nonferrous Foundrymen's Association		
Aluminum Casting Defects, Considers	Mar.	264
Pressure Molding, Considers	June	240
Shell Molding, Considers "D" Process of	Jan.	188
Shell Molding Equipment, Considers	Apr.	212
Connor Gate Controls Leakers	Mar.	214
Container, Offers Shipping	Oct.	241
Continental Foundry & Machine Co. Builds Huge Roll.....	Aug.	174
Contract Termination Guide, Issues Government.....	Dec.	168
Contractors Machinery Co. Offers Loader	Oct.	252
Control		
Electric Arc Furnace, Announces	June	265
For the Average Foundry, Molding Sand	Nov.	102
Fuel Burner, Develops	Jan.	227
Hydro-Arc Furnace, Develops	Oct.	256
Controller		
Electronic Indicating, Develops	Nov.	250
For Temperature Control System, Announces	Nov.	254
Recording, Offers	Sept.	245
Temperature, Announces	Nov.	247
Controls Ahead? (Ed)	July	77
Convention and Exhibits Show Future Trends, AFS	June	86
Convention Program 1954, AFS ..... Jan. 194;	May	116
Convention Program, Tentative 1955 AFS	Nov.	234
Convention Reports, AFS ..... June 136;	July	134
Conveyor		
All-Purpose, Designs Lightweight	Oct.	248
Belt, Announces	Nov.	252
For Hot or Abrasive Materials, Offers	Mar.	291
For Permanent Installation, Offers Roller	Feb.	235
How To Repair Belt for	Feb.	92
Installation and Maintenance of Belt for	Feb.	86
Lock Cable, Announces	May	434
Piano-Hinged Apron, Announces	Mar.	281
Portable Pneumatic, Announces	Jan.	229
Power Driven Roller Curve for, Offers	Jan.	234
Reciprocating, Develops	Aug.	204
Small Vibrating, Announces	June	264
Steel Belt, Develops	July	208
With Articulated Connections, Offers Mold	Aug.	196
Conveyor Belt Breaker Strip, Offers	May	446
Conveyor Belt Cleaner, Offers	Nov.	236
Conveyor Belt Cover, Announces	Feb.	243
Conveyor Roller, Announces	Nov.	249
Conveyor Equipment Manufacturers Elect	Jan.	192
Conveyor Equipment Manufacturers Issue Directory.....	Sept.	235
Cookware Expands Gray Iron Castings Market.....	Sept.	186
Cooper Alloy Foundry Co. Develops Mold Protectors.....	Feb.	167
Cooper Alloy Foundry Co., Making Jet Engine Rings at	Apr.	204
Cooper-Bessemer Corp. Casts Cylinders in 2 Parts.....	Sept.	155
Copease Co. Announces Photocopier	May	408
Copper Alloys, Studies Grain Refining Additions for (FD)...	Oct.	176
Copper, Arsenic Addition to (Q & A)	Aug.	100
Copper Base Alloy Castings, Test Bars for ..... June 96;	July	100
Copper-Silver-Lead Alloy, Develops Improved (FD).....	Mar.	158
Copper Supply, Reports Increase of	Dec.	33

	Issue	Page
Core Binder, Announces Resin	Mar.	293
Core Binders, Properties of Phenolic Resin	Dec.	100
Core Blow Plate, Announces	Sept.	252
Core Blower		
Attachment for, Announces	Apr.	242
Dual Head, Announces	Apr.	231
Fast Operating, Designs	May	428
Maintenance for Molding Machine and	Feb.	100
Twin Magazine, Announces	Sept.	244
Two-Station Automatic, Offers	Oct.	240
Core Blowing Equipment and Use (ABC) (II)	Jan. 168; Feb. 220; Mar.	237
Core Blowing in a Steel Foundry	Mar.	304
Core Drier, Offers Sand	Aug.	201
Core Machine, Announces	Nov.	237
Core Mixes for Aluminum Castings, Wants (Q & A)	Oct.	135
Core Paste, Announces	Apr.	231
Core Rod Straightener, Announces	Nov.	236
Core Sand Mixture for Bronze Bushings (Q & A)	Feb.	116
Core Sections, Uses Shellac with Resin Bonded	Nov.	160
Core Stick from Plaster Mold, To Remove	July	189
Corebox Machine, Announces Portable	Aug.	197
Corebox Vent, Announces	Jan.	215
Coremaking and Molding Equipment	May	148
Coremaking Equipment, Small	May	172
Cores		
Common Sense in	July	84
Eliminates Drying by Spraying of (FD)	Feb.	164
For Globe Valve Castings, Strainer (Q & A)	Feb.	118
Ganging Up Increases Production on Small	June	215
Method of Supporting Suspended (Q & A)	Mar.	124
Oil-Sand Strainer, Discusses (Q & A)	Mar.	128
Sticking of Green, Discusses (Q & A)	July	110
Strong Sand Mixture for Shell (Q & A)	Oct.	138
Coring Problem, Asbestos-Wrapped Bar Solves	Feb.	167
Corn Belt Chapter of the AFS Plans Casting Clinic	Nov.	228
Costs		
Alloy Gray Iron Casting	Mar.	122
In Malleable Iron Production, Cutting Refractory	June	106
Manpower and Production, Breaks down (Q & A)	May	200
On Aluminum Castings, Quoting	May	313
Coupler, Announces Air	Feb.	245
Coupler, Announces Automatic	Feb.	240
Coupling		
For High Pressure Applications, Offers	Dec.	208
Hose, Develops	Nov.	258
Geared Flexible, Offers	Apr.	245
Cracks Develop in Annealing Malleable Castings (Q & A)	Feb.	114
Crane		
Gas-Electric Powered Mobile, Offers	Dec.	219
Magnetic Control for, Announces	Sept.	256
Tractor Mounted Hydraulic, Announces	Jan.	224
Underhung Pushtype, Announces	Oct.	241
Crane Co. Rebuilds Malleable Iron Foundry	Feb.	170
Crane Packing Co. Offers Polishing Stand	May	442
Cranes for Metal Handling and Charging, Uses Yard	July	82
Crayon, Offers Metal Marking	Jan.	214
Crown Industrial Products Co. Offers Etcher	June	264
Crucible		
Instructions for Care of (FD)	Sept.	160
Lining for, Announces	July	218
Melting Steel in a (Q & A)	Oct.	138
Crucible Steel, Wants To Make (Q & A)	Mar.	126
Cupola		
Banking of, Discusses (Q & A)	Apr.	130
Control of Blast Moisture in the	Feb.	170
Ends Air Contamination, Closed-Top	Dec.	86
Design and Operation of a Modified (FD)	Aug.	181
Fluxing and Slagging of (Q & A)	May	202
Holding Iron in Well of (Q & A)	June	121
Lining of, Discusses (Q & A)	Apr.	134
Rapid Charging of the	Oct.	116
Second Spout to, Adds	Aug.	166
Seeks Information on Building (Q & A)	Nov.	142
Would Increase Melting Rate in (Q & A)	Nov.	144
Curtis Machine Corp.		
Contact Grinder, Announces	May	394
Platen Grinder, Offers	Apr.	238
Swing Frame Grinder, Announces	Aug.	196
Cutoff Machine, Announces	Jan.	220
Cutting Torch, Announces Heavy Duty	Apr.	238
Cybertronic Corp. of America Announces Controller	Nov.	247
Cybertronic Corp. of America Offers Pyrometer	Sept.	251
Cylinder, Announces Fluid Power	Sept.	254
Cylinder Blocks, Microstructure for (Q & A)	Oct.	136
Cylinder Blocks, Pours One-Piece	July	192
Cylinder Heads, Cause of Porosity in (Q & A)	Nov.	144
Cylinder Liner, Defects Appear on Gray Iron (Q & A)	Dec.	110
Cylinders		
Air and Hydraulic Stock, Offers	Apr.	237
In Shell Molds, Has Trouble Casting (Q & A)	Dec.	107
In Two Parts, Casts	Sept.	155

D

DCMT Sales Corp. Announces Reverberatory Furnace	Feb.	246
DCMT Sales Corp. Offers Die Casting Machine	Mar.	285
Dampener, Offers Vibration	June	276
Davis & Furber Machine Co., Gating at	Apr.	128
Davis Emergency Equipment Co. Offers Face Shield	Oct.	252
Dayton Malleable Iron Co. Acquires Ohio Malleable Iron Co.	Feb.	256
De Laval Steam Turbine Co., Huge Casting for	June	162
DeVilbiss Co. Announces Moisture Separator	Oct.	251
DeVilbiss Co. Offers Spray Painting Film	Feb.	142
De Walt Inc. Announces Safety Guard	Nov.	258
DeWalt Inc. Offers Woodworking Machine	Apr.	248
Defective Castings, Wants Average for (Q & A)	Sept.	128
Degassing of Nonferrous Metals, Vacuum	Dec.	78
Demmler, Wm., & Bros. Announces Corebox Vent	Jan.	215
Demmler, Wm., & Bros. Develops Core Blower	Sept.	244
Deoxidizer, Announces Carbide	Sept.	245
Dependable Machinery Co. Offers Exhaust Fan	Mar.	285
Dermatitis Prevention in the Foundry Industry	May	289
Desmond-Stephan Mfg. Co. Offers Wheel Dresser	Aug.	201
Desmond-Stephan Mfg. Co. Announces Wheel Dresser	May	410
Detector		
Electronic Metal, Announces	May	448
For Aluminum Alloys, Offers Gas	Dec.	207
Porosity, Announces	Nov.	237
Portable Leak, Develops	Sept.	252
Radiation, Develops	Mar.	288
Detroit Chapter of the AFS		
Ladies' Night, Holds	Dec.	186
National Officers' Night, Holds	Apr.	212
Quality Control, Considers	June	246
Detroit Electric Furnace Division Develops Control	May	325
Detroit Testing Machine Co. Offers Brinell Unit	Feb.	243
Die Casting Machine		
Cold Chamber, Designs	May	402
Cold Chamber High Pressure, Offers	Dec.	215
Continuous Operation, Designs	Mar.	285
Die Casting Magnesium, Close Control in	May	339
Die Casting, Magnesium	Feb.	102
Die Castings, Eliminating Defects in	Dec.	84
Dietert, Harry W., Co.		
Sand Flowability Test, Announces	Nov.	236
Sand School, Announces	July	33
Sand School, Holds Fifth Annual	Dec.	230
Speed Balance, Announces	Mar.	293
Dillon, W. C., & Co. Offers Safety Switch	Nov.	250
Dillon, W. C., & Co. Offers Testing Machine	Apr.	240
Dings Electronics Inc. Offers Metal Detector	May	448
Dispenser, Offers Skin Cleanser	Feb.	245
Dixon, Joseph, Crucible Co. Offers Marking Crayon	Jan.	214
DoAll Co.		
Band Saw, Announces Semi-Automatic	May	440
Band Machine, Offers Variable Speed	Oct.	241
Tool Grinder, Announces	Mar.	292
Dodge Mfg. Corp., Quality Control at	Oct.	126
Doehler-Jarvis Division Installs Die Casting Machine (FD)	Aug.	181
Doepke, Chas. Wm., Mfg. Co. Offers Steel Box	Nov.	243
Dolly, Offers Pattern Carriage Changeover	Dec.	208
Door Sill, Wants Abrasive Facing on (Q & A)	Sept.	127
Dotmar Industries Inc. Offers Pneumatic Hammer	May	452
Dow Chemical Co. Develops Magnesium Die Cast Process	Dec.	33
Dow Corning Corp.,		
Leather Preservative, Announces	Apr.	248
Parting Agent for Shell Molding, Offers	July	209
Release Agent for Shell Molding, Develops	June	264
Drain, Announces Automatic	May	399
Draper Corp. Develops Ladle Drying Unit (FD)	May	236
Dravo Corp. Announces Space Heater	July	223
Dressing Tool, Announces Diamond	Feb.	229
Drive		
Adjustable Speed, Announces	May	432
And Take-up, Offers Center	Oct.	248
Conveyor, Designs	May	444
For Fork Truck, Offers Automatic	May	430
Drum Cleaning Machine, Announces	Aug.	196
Dryer, Announces Drum	Nov.	257
Dryer, Offers Aggregate Gas	Dec.	218
Ductility of Nodular Irons, Notch	Sept.	114
Dumper, Announces Fork Truck	Jan.	234
Duplexing Procedure, British Steelmaker Develops (FD)	May	236
Dupont de Nemours, E. I., & Co. Offers X-ray Film	Feb.	224
Durez Plastics & Chemicals Inc. Explains Shell Molding	Jan.	165
Dust Bin, Offers Portable	Mar.	291
Dust Collector		
Cabinet Type, Announces	May	393
Centrifugal Wet, Designs	Sept.	262
Cloth Bag, Announces	Mar.	289
Cylindrical Cage Type, Announces	July	209
Reverse Jet Fabric, Designs	Apr.	230
Dust Hood for Foundry Use, Offers	Feb.	234
Dust Removal System, Offers	June	265
Dye for Core Mix Identification, Develops (FD)	Oct.	176
Dwyer, Pat 1875-1954	Feb.	136

E

Ear Protector, Announces	July	218
Ear Protector, Develops	Sept.	254
East Coast Regional Conference, Holds AFS	May	304
East Coast Regional Conference, Plans AFS	Feb. 33; Mar.	234
Eastern Malleable Iron Co. Reaches 50th Year	Feb.	204
Eastern New York Chapter of the AFS		
American Society for Metals, Meets with	July	198
Casting Defects, Considers	Dec.	188
Cost Control, Considers	May	378
Shell Molding, Considers	Nov.	195
Eclipse Fuel Engineering Co.		
Dryer, Announces Aggregate Gas	Dec.	218
Fuel Oil Pump, Announces	Apr.	242
Melting Furnace, Announces	Sept.	244
Oil Separator, Announces	May	422
Pots, Offers Heat Treating	Aug.	196
Relief Valve, Announces	Mar.	290
Economy Weeds out Foundry Waste, Production (Ed)	Apr.	101
Edison, Thomas A., Inc. Offers Storage Battery	Sept.	260
Editorial:		
Controls Ahead?	July	77
Emphasizing Quality	Oct.	103
Getting Ready	June	85
Have You Kept Pace?	May	111
It's Time To Cut Waste	Feb.	85
Keep Them Running	Mar.	101
Let's Talk Castings!	Aug.	69
Modernize Your Thinking	Sept.	101
Restrictions Are Needed	Nov.	101
Then What Happened?	Jan.	85
Weed out the Waste	Apr.	101
Why Take Chances?	Dec.	77
Electric Furnace Co. Offers Atmosphere Tester	May	424
Electric Furnace Steel Conference, Holds	Jan.	128
Electric Machinery Mfg. Co. Offers Protected Motor	Aug.	202
Electric Plant, Develops	Dec.	207
Electric Steel Foundry Co. Offers Booklet	Jan.	152
Electric Storage Battery Co. Offers Lighting Unit	Feb.	242
Electro Metallurgical Co. Plans Titanium Plant	Oct.	35
Electro Refractories & Abrasives Corp.		
Calcium Boride, Increases Sale of (FD)	Nov.	230
Carbide Deoxidizer, Announces	Sept.	245
Crucible Lining, Announces Alumina	July	218
Furnace Lining, Announces	Feb.	233
Instructions for Crucible Care, Issues (FD)	Sept.	160
Refractory Cement, Develops (FD)	Aug.	181

	Issue	Page
Tube for Making Car Wheels, Develops (FD)	Dec.	156
Wheel Rack, Offers	Jan.	220
Electrochemical Society Plans Meeting	Oct.	239
Electrode		
Flux-Coated, Develops	Sept.	254
For Alloy and Cast Steel, Announces	Nov.	242
For Arc Welding, Offers Aluminum	Nov.	244
For Hard-Facing Applications, Announces	July	210
For Overlaying Alloys, Offers Bronze	July	220
For Welding Cast Iron, Offers	Mar.	294
For Welding Manganese Bronze, Offers	Sept.	260
Hard-Facing, Announces	Feb.	246
Low Nitrogen Steel, Announces	Apr.	238
Electrode Control Cuts Furnace Operating Costs	May	325
Electrode Holder, Offers Lightweight	Apr.	240
Elwell-Parker Electric Co. Offers Platform Truck	Nov.	236
Embrittlement, Malleable Iron (Q & A)	Mar.	125
Emjay Maintenance Engineers Offers Metal Coating	Mar.	295
Emphasizing Quality (Ed)	Oct.	103
Empire Steel Castings Inc. Modernizes Foundry	Dec.	94
Enamelware, Cast Iron for Porcelain (Q & A)	May	198
Engineering Students, Offers Magazine to	Mar.	140
Engineer's Role in the Foundry, The	Jan.	98
Engines, Ford Pushes Production of Turbojet	Jan.	151
Equipment		
And Supplies, New: Jan. 214; Feb. 224; Mar. 280; Apr. 230; May 392; June 264; July 208; Aug. 196; Sept. 244; Oct. 240; Nov. 236; Dec. 206		
Foundries Must Study New (Ed)	May	111
Inventory of Foundry	May	146
Miscellaneous	May	162
Small Foundry	May	164
Small Related	May	194
Erico Products Inc. Develops Toggle Clamp	Feb.	247
Eriez Mfg. Co. Offers Alarm System	Apr.	250
Eshelman, Cheston L., Co. Offers Power Sweeper	Jan.	229
Etcher, Announces	June	264
European Industrial Federation Council Meets	July	226
Eutectic Welding Alloys Corp.		
Electrode for Gray Iron Welding, Offers	Apr.	294
Electrode, Offers Bronze	July	220
Overlay Material, Announces	May	416
Welding Film, Offers	Apr.	204
Welding Rod for Sealing Cracks, Announces	Jan.	215
Evans, Robert G., Co. Offers Masonry Saw	May	450
Even-Cut Abrasive Band Co. Offers Wheel	Dec.	214
Evanson Equipment Co. Offers Clamp Vise	May	424
Exomet Inc. Develops Gas Detector	Dec.	207

F

Face Shield		
Cap-Type, Announces	June	274
Swing-Back Type, Develops	Sept.	259
With Spark Deflector, Offers	Oct.	252
Facing for Permanent Mold Casting, Wants (Q & A)	Apr.	132
Factory Service Co. Offers Pallet Box	Nov.	249
Fairbairn Lawson Combe Barbour Ltd. Offers Shell Mold Machine	May	414
Fairbanks, Morse & Co. Dedicates New Plant	July	180
Fairbanks, Morse & Co., Modern Foundry of	Oct.	104
Fairfield Glove Co. Offers Work Gloves	Mar.	295
Falk Corp. Announces Speed Reducer	Mar.	292
Falkirk Iron Co. Ltd. Expedites South African Goods	Aug.	174
Fan		
Heavy-Duty Direct Drive, Announces	July	208
Industrial Exhaust, Announces	Mar.	285
Sheet Metal Exhaust, Offers	Mar.	292
Far-Ex Corp. Offers Protective Clothing	Nov.	254
Farnco Sales Co. Offers All-Purpose Conveyor	Oct.	248
Farrell-Cheek Steel Co., Progressive Policies of	Apr.	108
Fatigue Strength, Surface Rolling Affects (FD)	Jan.	176
Faucet, Pinholes Appear on Spout of (Q & A)	Mar.	125
Fauver, J. N., Co. Designs Conveyor Lubricator	Sept.	260
Federal Foundry Supply Co.		
Core Blow Plate, Announces	Sept.	252
Core Blower Attachment, Announces	Apr.	242
Foundry Boards, Offers	Aug.	204
Mold Blower, Announces	May	393
Federal Sign & Signal Corp. Offers Signal Light	Sept.	250
Federated Metals Division Holds Casting Clinics	Dec.	189
Federated Metals Division Plans Casting Clinics	Oct.	36
Feedrail Corp. Announces Trolley	Dec.	215
Feeder, Announces Vibratory	Nov.	244
Feeding Characteristics of Gray and Nodular Iron	June	108
Fenlind Engineering Co. Offers Idler	Nov.	258
Fenwal Inc. Offers Fluid Control	Mar.	288
Ferguson, Harry J., Co. Offers Conveyor Curve	Jan.	234
Ferrochromium Alloy, Offers	Jan.	231
Ferrous Casting Shipments	Dec.	196
Ferrule Will not Tin or Take Solder (Q & A)	Mar.	128
Fiberite Corp. Offers Sand Core Drier	Aug.	201
Fidelity Products Co. Offers Storage Cabinet	May	420
File, Develops Carbide Hand	June	265
Filing Reduces Foundry Costs, Band	Mar.	108
Film		
Cutting and Welding Safety, Offers	Feb.	264
Fine Grain Industrial X-ray, Offers	Feb.	224
Grinding Wheel Safety, Offers	July	237
Human Relation Training, Offers	Mar.	238
Malleable Metals, Offers	Sept.	171
On Welding Procedures, Offers	Apr.	204
Shell Molding, Announces	Sept.	170
Smith Steel Casting Co. Makes Foundry	May	310
Spray Painting, Offers	Feb.	142
Two Sets of Safety, Offers	Dec.	251
Ultrasonic Inspection, Offers	Mar.	212
Film Processing Solution, Offers X-ray	Mar.	281
Filter		
Air Line, Announces	Aug.	201
For Dewatering Granular Materials, Develops	May	404
For Respirator, Announces	Sept.	249
Granule Cell, Announces	Oct.	242
Finishing and Cleaning Equipment	May	158
Fire Extinguisher, Offers Automatic	Mar.	282
Fire Extinguisher Cart, Announces	Nov.	247
Fire Hazards, Describes	Nov.	228
Fire Prevention, Rules for Plant	Mar.	120
Fire Safety Device, Offers	Mar.	294
Firebrick, Announces Vermiculite	Mar.	292
Fireproof Processing Products, Offers	Jan.	234
Fischer Casting Co. Holds Open House	Oct.	230
Fischer, George, Ltd. Issues Wheel Story	May	336
Fitting the Worker to His Job	Sept.	124
Flagg, Stanley G., & Co. Completes 100 Years	Oct.	186
Flame Hardening of Gray Iron Castings	Apr.	114
Flash-Stone Co. Announces Steel Plate Flooring	June	274
Flash-Stone Co. Offers Steel Plate Flooring	Jan.	228
Flasks, Aluminum Alloy for (Q & A)	Mar.	125
Flatback, Instructions for Casting (Q & A)	Nov.	141
Flexible Steel Lacing Co. Offers Belt Fastener	May	440
Float Unit, Offers Automatic	Dec.	214
Floating Foundries	Aug.	88
Floor Cleaning Can Be Done Efficiently	Nov.	174
Floor Plate Is not Flat, Surface of (Q & A)	June	122
Floor Repair Compound, Offers	Nov.	247
Floor Resurfacer, Announces	Jan.	232
Flooring		
Heavy Duty, Announces	Feb.	240
Rolled Steel Plate, Announces	June	274
Rolled Steel Plate, Develops	Jan.	228
Flour Additions Cause Porosity in Brass Castings (FD)	Sept.	160
Fluid Control, Announces	Mar.	288
Fluophosphoric Acid Removes Sand Adherents (FD)	June	160
Fluoroscope, Announces Gamma Ray	Mar. 290; May	392
Food Machinery & Chemical Corp. Offers Fire Truck	Oct.	252
Foot Bath Tray, Offers	May	446
Ford Motor Co.		
Chicago Magnesium Foundry, Closes	Apr. 184; May 238; Sept.	173
Cleveland Foundry Increases Capacity	Aug.	33
Cleveland Foundry, "Smithy" Is Important at	Dec.	222
Dearborn Foundry Installs Closed-Top Cupolas	Dec.	86
Mahogany Veneer for Shell Molds, Uses (FD)	June	160
National Safety Council Award, Wins	Sept.	272
Radioactively Tagged Iron Ore, Studies	Apr.	206
Turbojet Engine Production, Pushes	Jan.	151
Foremen—Working or Thinking	Sept.	216
Forging Iron Castings, Hot	July	86
Fork Lift Attachment, Offers	Nov.	246
Foster, L. B., Co. Offers Rail Skids	May	424
Foster Mfg. Co. Announces Automatic Coupler	Feb.	240
Foster Supplies Co. Offers Height Gage	May	426
Foundry Boards, Announces	Aug.	204
Foundry Cuts Costs with Moderate Investment	Apr.	172
Foundry Data Sheet		
Casting Weight Formulas (VII):	Jan. 173; Feb. 175; Mar.	207
Chill Testing Cast Iron	May	273
Inspection of Castings, Reference Radiographs for	June	169
Light Metals and Alloys, Recommended Practice for	June	170
Mechanical Testing Terms	July	231
Rapid Indentation Hardness Testing-Metallics	Oct.	228
Specifications (Standard):		
Silicon Bronze and Silicon-Brass Castings	Nov.	203
Tin-Bronze and Leaded Tin-Bronze Sand Castings	Dec.	199
Specifications (Tentative):		
Automotive Gray Iron Castings	Sept.	151
Ferromanganese	Oct.	227
Magnesium-Base Alloy Sand Castings	Apr.	193
Nickel-Tin Bronze Castings	Aug.	149
Foundry Developments: Jan. 176; Feb. 164; Mar. 158; Apr. 206; May 236; June 160; July 132; Aug. 181; Sept. 160; Oct. 176; Nov. 230; Dec. 156		
Foundry Educational Foundation		
College-Industry Conference, Holds	May	276
College-Industry Conference, Plans	Mar.	216
College-Industry Conference, View of	May	268
Yearbook, Publishes 1954	Nov.	232
Foundry Employment Statistics: Jan. 143; Feb. 147; Mar. 155; Apr. 159; May 249; June 165; July 157; Aug. 131; Sept. 237; Oct. 233; Nov. 177; Dec. 195		
Foundry Equipment, Inventory of	May	146
Foundry Equipment Co. Offers Core Oven	June	264
Foundry Equipment Manufacturers Association		
Annual Meeting, Holds 36th	Dec.	126
Washington Headquarters, Establishes	Sept.	33
Yearbook, Publishes	May	356
Foundry Equipment Orders: Jan. 144; Feb. 148; Mar. 156; Apr. 160; May 250; June 166; July 158; Aug. 132; Sept. 238; Oct. 234; Nov. 178; Dec. 196		
Foundry Equipment, Things To Watch in Buying	Dec.	228
Foundry Facings Manufacturer's Association Meets	Feb.	34
Foundry Groups, Activities of: Jan. 178; Feb. 206; Mar. 262; Apr. 208; May 368; June 236; July 195; Aug. 184; Sept. 232; Oct. 214; Nov. 182; Dec. 181		
FOUNDRY Index Is Ready	Feb.	154
Foundry Industry		
Aids to Progress in the (Ed)	June	85
Report on the	July	183
Should Modernize Thinking (Ed)	Sept.	101
FOUNDRY Readers Service: Jan. 251; Feb. 261; Mar. 317; Apr. 67; May 329; June 233; July 193; Aug. 51; Sept. 67; Oct. 201; Nov. 67; Dec. 243		
Foundry Show Exhibitors, AFS	May	122
Foundry Show Features New Equipment	June 92; July 124; Aug.	118
Foundry Statistics: Jan. 143; Feb. 147; Mar. 155; Apr. 159; May 249; June 165; July 157; Aug. 131; Sept. 237; Oct. 233; Nov. 177; Dec. 195		
Foundry Suppliers, Names of	Mar.	184
Foundry Terms, Derivation of (Q & A)	May	202
Foundrymen Face Normal Conditions (Ed)	Jan.	85
French Foundries Employ Modern Methods	Dec.	90
French Foundry Association Elects Officers	May	301
French Foundry Technical Center Publishes Dictionary	Feb.	251
French Foundry Technical Center Issues 1953 Report	Nov.	271
Frick-Gallagher Mfg. Co. Offers Storage Rack	Dec.	206
Fuel Additive, Announces	June	269
Fuller Brush Co. Announces Push Broom	June	277
Fuller Brush Co. Offers Drive Assembly Plan	Feb.	225
Furnace		
Cutting Refractory Cost in the Malleable Iron Air	June	106
Dielectric, British Research Association Develops (FD)	July	132
Double-Chamber Melting, Announces	Sept.	244
Electrode Control Cuts Operation Cost	May	325
Gas-Fired Soldering, Announces	Jan.	214
Melting Iron in the Reverberatory	Mar.	224
Reverberatory, Announces Small	Feb.	246
Small Brass Melting, Wants To Build (Q & A)	Dec.	196

	Issue	Page
Furnace Charging Equipment, Small	May	179
Furnace Cover, Develops Floating (FD)	Feb.	164
Furnace Lining, Announces Two-Piece	Feb.	233

G

Gage		
Acid and Rust Proof Height, Announces	May	426
For Saw Table, Announces	July	209
Quick Reading, Offers	May	414
Gage Block Set, Announces	June	270
Galion Allsteel Body Co. Offers Steel Pallet	Oct.	242
Galvicon Corp. Offers Protection Coating	Nov.	256
Gamma Industries Inc. Offers Machine	Nov.	258
Gamma Ray Machine, Offers	Nov.	258
Gangway: Jan. 148; Feb. 222; Mar. 238; Apr. 175; Sept. 216; Nov. 142; Dec. 110		
Garrett Supply Co. Holds Grinding Symposium	Feb.	139
Gas Analysis of Cast Iron, Reports (FD)	Jan.	176
Gas Analyzer, Installs Vacuum Fusion (FD)	July	132
Gas Porosity in Aluminum Castings	Aug.	176
Gases through Iron, Effect of Bubbling (FD)	Dec.	156
Gating of Manganese Bronze Castings	Apr.	128
Gating Factors	Apr.	102
Gelation Papers for Determining pH value of Sand (FD)	Apr.	206
General Communications Inc. Offers Storage Battery	Aug.	202
General Electric Co.		
Carboloy Dept., Electric Magnet Foundry at	Jan.	86
High-Voltage Radiography, Utilizes	Feb.	108
Ignitron Tubes, Announces	Feb.	224
Lamp, Announces Infrared	Sept.	252
Lighting Control, Develops	Feb.	244
Microscope, Develops X-ray (FD)	Oct.	176
Microscope, Offers X-ray	Dec.	156
Productive Maintenance at	Sept.	122
Radiation Digest, Publishes	Sept.	219
Recording Controller, Announces	Sept.	245
Rectifier Type Welder, Offers	Apr.	244
Resin, Announces Phenolic	Dec.	207
Shell Mold Foundry, Opens	Aug. 33; Sept.	266
Shell Molding Film, Offers	Sept.	170
Vacuum Fusion Gas Analyzer, Installs (FD)	July	132
Welding Helmet, Announces	June	270
X-ray Film Processing, Offers	Mar.	281
General Foundry Service Corp. Offers Pattern Plate	Apr.	231
General Motors Corp.		
Allison Division Eliminates Hot Boxes (FD)	Nov.	230
Allison Division Installs Precision Instrument (FD)	Nov.	230
Buick Motor Division, Automation at	Oct.	152
Buick Motor Division, Enlarges	Aug.	174
Pontiac Installs Skip Charging System	Oct.	248
Research Laboratories Develop Comparator (FD)	Apr.	206
General Paint Corp. Offers Heat Resistant Paint	Oct.	245
General Scientific Equipment Co. Offers Bath Tray	May	446
General Scientific Equipment Co. Offers Dust Hood	Feb.	234
General Steel Castings Corp., Sand System at	Sept.	209
German Foundrymen Meet	Feb.	139
Gerwin Industries Inc. Offers Sand Distribution Unit	Feb.	224
Give the United Way	Oct.	190
Glo Corp. Offers High Heat Lubricant	Dec.	207
Globe Stamping Division Offers Power Tilt	Sept.	246
Gloves		
Cut Accidents, Survey Shows Work	Mar.	238
Industrial Work, Offers	Mar.	295
Steel-Tipped Safety, Announces	Jan.	215
Glue, Offers Pattern	Oct.	255
Goggles		
Lightweight Plastic, Announces	Oct.	253
Protective Visor, Designs	Sept.	254
Tip Temples for, Announces	Mar.	286
To Fit over Glasses, Offers Cover	Feb.	226
Ventilated Chippers', Offers	Dec.	219
Welding, Offers	May	438
With Adjustable Hinged Bridge, Offers	Sept.	252
Goodman Mfg. Co. Offers Shaker Conveyor	Mar.	291
Goodrich, B. F., Co.		
Belting, Announces Conveyor	May	404
Conveyor Belt Insert, Offers	Oct.	254
Open-Hearth Furnace Hose, Develops (FD)	Dec.	156
Gould-National Batteries Inc. Offers Cell Puller	Jan.	228
Grafton Foundry Co. Builds Aluminum Foundry Building	Mar.	211
Grain Refining Additions, Investigates (FD)	Oct.	176
Graphite		
In Cast Iron, Undercooled (FD)	Aug.	181
For Thin Iron Castings, Additions of (FD)	Sept.	160
Investigates Structure of Spherulites in (FD)	Apr.	206
On Cast Iron, Effect of (FD)	July	132
Graphitizing Agents Increase Machinability (Q & A)	Feb.	116
Gray Iron, Feeding and Solidification of	June	108
Gray Iron Castings		
Flame Hardening of	Apr.	114
Specifications for, Wants ASTM (Q & A)	Nov.	144
Steel Inserts in (Q & A)	June	122
Warpage Causes Trouble in (Q & A)	Dec.	108
White Fractures Appear in (Q & A)	Apr.	130
Gray Iron Founders' Society		
Annual Directory, Publishes	Nov.	167
Annual Meeting, Plans	Oct.	214
California Meeting, Holds	Aug.	144
Cost Manual No. 2, Prepares	Aug.	33
Eye Protection Report, Publishes	May	360
Officers, Elects	Dec.	33
Questionnaires Seek Foundry Data	Mar.	235
Redesign Contest Rules, Announces	May	238
Sales Campaign, Sponsors Casting	Feb.	158
Gray Iron Foundry, Molding Sand Use in the	Nov.	116
Gray Iron Machinability, Annealing Improves	Jan.	110
Grids in Concrete Resist Wear, Iron (Q & A)	Sept.	126
Gries Industries Inc. Offers Hardness Tester	July	215
Gries Industries Inc. Offers Hardness Tester	Sept.	256
Grieve-Hendry Co. Offers Batch Oven	Dec.	206
Grinder		
Abrasive Belt, Announces	June	272
And Polisher, Announces German-Made	May	394
Double End Snagging, Announces	Nov.	244
For Heavy Duty Die Grinding, Offers	May	400
For Milling and Polishing, Announces	Mar.	282
Heavy-Duty Carbide, Offers	May	428
Horizontal Platen, Announces	Apr.	238
Lightweight Portable, Announces	May	422
Lightweight Vertical, Announces	Nov.	237
Single-Phase and Three Phase, Redesigns	July	215
Single-Wheel Wet, Develops	June	264
Swing Frame, Offers Versatile	Aug.	196
Tool and Drill, Announces	Mar.	292
Wet or Dry Carbide Tool, Offers	Sept.	252
Wheel Belt, Offers	Nov.	252
With Finger Tip Speed Control, Offers	Nov.	246
With Protective Hood, Announces Core	May	392
With Variable Speeds, Offers Hand	May	446
Grinding Disc, Offers Abrasive	Nov.	256
Grinding, Issues Safety Hints in	Dec.	204
Grinding Operation, Jig Holds Castings in	Jan.	156
Grinding Operations in the Cleaning Room (ABC)	May 384; June	220
Grindle Corp. Holds National Sales Meeting	Sept.	194
Grinding Wheel, Announces Flexible	Sept.	244
Guard, Announces Safety	Nov.	258
Gun		
Heavy Duty Air Pressure, Offers	Dec.	212
Metallizing Spray, Announces	Dec.	218
Pneumatic Refractories, Develops	Apr.	232
Wet-Mix Refractories, Announces	Oct.	240

H

Hamilton Foundry & Machine Co.'s Christmas Party	Feb.	178
Hamilton Rubber Mfg. Co. Announces Air Hose	Nov.	244
Hamilton Rubber Mfg. Corp. Offers Fire Hose	June	269
Hammer		
Air Operated Drop, Announces	Dec.	218
Pneumatic, Offers Pistol-Type	May	452
Weld Chipping, Announces	Apr.	245
Hammond Machinery Builders Inc. Offers Belt Grinder	June	272
Hammond Machinery Builders Inc. Offers Tool Grinder	Sept.	252
Hand Cleaner, Announces	Apr.	232
Hanna Engineering Works Offers Power Cylinder	Sept.	254
Hanna Nickel Smelting Co. Acquires Slag Pots	July	178
Hannifin Corp. Offers Poppet-Type Valve	Jan.	230
Hapman Conveyors Inc. Offers Bucket Trolley	July	208
Hardman, H. V., Co. Offers Industrial Adhesive	May	394
Hardness Tester		
For Conveyor System, Designs	Jan.	219
Hand Operated Metal, Announces	Jan.	231
Multiple Angle, Announces	Feb.	225
Hardness Testing of Metallics (Data Sheet)	Oct.	228
Harnischfeger Corp. Announces Rectifier Brake	Nov.	246
Harnischfeger Corp. Offers Crane Scale	July	223
Harrison Abrasive Division Offers Cut Wire Shot	Jan.	224
Hartzell Propeller Fan Co. Offers Blower	Jan.	222
Harvill Mfg. Co. Offers Die Casting Machine	May	402
Hauck Mfg. Co. Announces Oil Burner	May	402
Hays Mfg. Co. Offers Solenoid Valve	Aug.	202
Health Conference, Plans Industrial	Feb.	158
Heat Exchanger, Announces	Oct.	241
Heat Recovery Unit, Announces	Feb.	233
Heat Resistance of Stoveplate Iron, To Increase (Q & A)	July	110
Heat Treating and Melting Equipment	May	152
Heat Treating Unit, Announces	Feb.	225
Heat Treatment Improves Wear Resistance and Strength	Apr.	114
Heat Treatment Softens Gray Iron	Jan.	110
Heater		
Electric Radiant, Develops	Feb.	230
For Steam and Hot Water Operation, Offers Unit	Sept.	251
Gas-Fired Space, Offers	Jan.	214
Gas-Fired Warm Air Space, Develops	July	223
Nozzle, Develops	Mar.	280
Portable Air, Announces	Nov.	250
Portable Air, Redesigns	Jan.	227
Portable Oil-Fired, Announces	Jan.	232
Helmet, Announces Welding	June	270
Heppenstall Co. Designs Tank Tongs	Mar.	142
Herman Pneumatic Machine Co. Offers Molding Machine	Aug.	204
Hewitt-Robins Inc.		
Conveyor, Announces Vibrating	June	264
Indicator, Offers Level	May	418
Shakeout to University of Wisconsin, Presents	Aug.	226
Heyl & Patterson Inc. Offers Moisture Meter	Mar.	288
High-Pressure Molding	Apr.	111
Hild Floor Machine Co. Offers Vacuum Machine	Mar.	289
Hills-McCanna Co.'s Magnesium Sand Foundry	Mar.	102
Hirsh, S. A., Mfg. Co. Offers Wireless Intercom Plugs	July	216
Hoffman, U. S., Machinery Corp. Designs Cleaner	Sept.	250
Hoffman, U. S., Machinery Corp. Offers Blower	Oct.	248
Hoist		
Electric Wire-Rope, Announces	Apr.	237
Lightweight Electric, Announces	Nov.	255
Lowhead Chain, Announces	Nov.	236
Overhead Heavy Duty, Announces	Nov.	241
Portable Winch, Announces	Dec.	213
Quick Action Wire Rope, Offers	July	222
With Steel Chassis, Offers Electric	Nov.	257
Hold-Back for Bucket Elevator, Offers	Mar.	286
Homer Mfg. Co.		
Magnetic Floor Sweeper, Announces	Nov.	255
Separator, Offers Magnetic	June	264
Sweeper, Announces Magnetic	Feb.	232
Hook, Announces Drop Forged Sling	July	220
Hook for Lifting Operations, Offers Safety	Sept.	257
Hopper, Announces Gravity-Fed Work	Feb.	22[illegible]
Hopper, Redesigns Motorized	June	26[illegible]
Hose		
For Fire Fighting, Announces	June	269
For Open-Hearth Furnace, Develops Heat Resistant (FD)	Dec.	156
Oil Resisting All Purpose, Develops	Sept.	258
Rayon Cord Air, Offers	Nov.	244
Hot Boxes, Overcomes (FD)	Nov.	230
Hot Plate, Announces Heavy-Duty Electric	Apr.	242
Hot Tearing		
In White Iron	Apr.	122
Of Carbon Cast Steel, Stress Required for (FD)	Aug.	181
Stress vs Strain in	Aug.	76
Hot Working of Iron Castings	July	86
Hough, Frank G., Co.		
Landscape Beautification Award, Receives	Apr.	181
Loader, Develops Front	Sept.	260
Torque Drive, Announces	July	209

	Issue	Page
Towing Tractor, Announces	Mar.	287
Houghton, E. F., & Co. Offers Core Binder	Mar.	293
Houghton, E. F., & Co. Offers Fireproof Products	Jan.	234
Houghton Laboratories Inc. Announces Liquid Resin	Apr.	232
How To Do It: Jan. 156; Feb. 167; Mar. 248; Apr. 201; May 333; June 215; July 189; Aug. 166; Sept. 268; Oct. 204; Nov. 160; Dec. 154		
How To Make Casting when You Can't Get Core out	Sept.	155
Howard Foundry Co.		
Furnace for Titanium Castings, Designs (FD)	June	160
Investment Casting Facilities, Completes	Aug.	94
Investment Castings Production, Starts	Sept.	242
West Coast, Expands on	Apr.	204
Howell Foundry Co. Installs Mechanical Handling	May	362
Human Relations Booklet, Issues	Mar.	140
Human Relations, How Management Can Improve	July	90
Humidity Control in Cupola Melting	Feb.	170
Hunt, C. B., & Son Inc. Announces Control Valve	Feb.	238
Hunt, C. B., & Son Inc. Offers Valve Coupling	May	393
Hunt, Rodney, Machine Co. Offers Work Positioner	Feb.	234
Hydraulic Press Mfg. Co. Offers Die Casting Machine	Dec.	215
Hydraulic Press Mfg. Co. Offers Valves	May	408
Hydro-Blast Corp.		
Conveyor, Redesigns Reciprocating	Aug.	204
Core Rod Straightener, Announces	Nov.	236
Filter, Offers Pressure	May	404
Hydrogen Content during Steelmaking, Studies (FD)	June	160
Hygiene Research Inc. Offers Chemical Cloth	Sept.	254

I

Ice-Crushing Machine by Shell Molding, Produces (FD)	Oct.	176
Ideas for Foundrymen: Jan. 217; Feb. 227; Mar. 283; Apr. 233; May 399; June 266; July 211; Aug. 198; Sept. 247; Oct. 243; Nov. 239; Dec. 209		
Idler		
For Grinding and Polishing, Offers Back Stand	June	266
Heavy-duty Backstand, Develops	Nov.	258
Permanently Lubricated, Offers	Nov.	237
Suspension, Develops	Oct.	240
Imperial Belting Co. Offers Heat-Resistant Belting	Feb.	234
Impregnation, Improvements in Casting	Feb.	248
Impregnation System, Offers	Jan.	215
India, Foundry Training Center in	Apr. 33,	201
Indiana Brass Co., Mechanization at	Aug.	212
Indian Institute of Technology Graduates First Class	Sept. 33; Dec.	147
Indicator		
Crane Weight, Develops	Apr.	245
For Complete Readings, Offers Temperature	Dec.	219
Level, Offers Material	May	418
Portable Temperature, Announces	May	406
Smoke Density, Announces	Dec.	206
Induction Heating Corp. Offers	June	262
Induction Melted Aluminum Alloy	Aug.	84
Industrial Craftsmen Inc. Announces	Nov.	237
Industrial Crane & Hoist Corp. Announces Crane	Oct.	241
Industrial Engineer, The	Jan.	98
Industrial Furnace Manufacturers Association		
Annual Meeting, Holds	Mar.	248
Heating Sessions, Plans	Sept.	197
Industrial Heating Equipment Association, Becomes	Sept.	34
Industrial Heating Equipment Association, Furnace Manufacturers Becomes	Sept.	34
Industrial Management Society Plans Time Study Clinic	Aug.	194
Industrial Metal Protectives Inc. Offers Coating	May	392
Industry Briefs: Jan. 155; Feb. 160; Mar. 211; Apr. 162; May 253; June 202; July 170; Aug. 170; Sept. 194; Oct. 186; Nov. 162; Dec. 152		
Infrared Rays, Heat Transfer Rate Is High with (Q & A)	Apr.	131
Ingersoll-Rand Co. Offers Air Compressor	Sept.	245
Ingot Brass & Bronze Shipments: Jan. 144; Feb. 148; Mar. 156; Apr. 160; May 250; June 166; July 158; Aug. 132; Sept. 238; Oct. 234; Nov. 178; Dec. 196		
Ingot Mold Foundry, Modernizes	June	188
Ingots, Offers Palletized	May	452
Inland Steel Co. Issues Steel Text	May	260
Insert, Announces Conveyor Belt	Oct.	254
Inserts in Steel, Casting-in (Q & A)	Sept.	126
Inspection		
High Voltage X-Radiation in Radiographic	Feb.	108
Instrument for Ultrasonic, Develops (FD)	Nov.	230
Reference Radiographs for Casting (Data Sheet)	June	169
Inspection Kit, Offers	Oct.	247
Inspection Material, Offers Fluorescent	June	265
Inspection Unit, Offers Conveyorized	Apr.	231
Institute of British Foundrymen		
Annual Meeting, Holds	Aug.	135
Annual Meeting, Plans	June	196
Conference Technical Papers	Sept.	182
Fiftieth Anniversary, Marks	June	180
Fiftieth Year Program, Plans	Mar.	244
Proceedings, Publishes Annual	Nov.	219
Intensifier, Offers Shot Pressure	Dec.	208
International Foundry Congress		
Florence, Italy Is Host to 1954	Dec.	170
Program of the 1954	Sept.	171
Twenty-First Annual, Plans	May	301
Instrument Society of America Plans Clinic	Apr.	265
International Harvester Co., Shell Molding at	Aug.	126
Inventory of Foundry Equipment	May	146
Inventory Machine, Announces Electronic	Jan.	229
Investment Casting Institute		
Annual Meeting, Holds Second	Dec.	140
Annual Meeting, Plans	Oct. 217; Nov.	33
General Meeting, Announces	May	240
Industry Survey, Plans	May	333
Spring Meeting, Holds	June	178
Technical Consultant, Names	June	155
Investment Casting Process		
Design and Dimensional Control for	Sept.	120
Howard Foundry Completes Facilities for	Aug.	94
Shaw Processes Develops	Sept.	242
Technical Reports on, Issues (FD)	Apr.	206
Investment Material, Patents (FD)	Dec.	156
Investment Mold Patterns, Uses Mercury in (FD)	Feb.	164
Ipsen Industries Inc. Offers Heat Treating Unit	Feb.	225
Ipsen Industries Inc. Offers Metal Cleaner	Mar.	280
Iron and Steel Scrap Consumption: Jan. 144; Feb. 148; Mar. 156; Apr. 160; May 250; June 166; July 158; Aug. 132; Sept. 238; Oct. 234; Nov. 178; Dec. 196		
Iron, Effect of Bubbling Gases through (FD)	Dec.	156
Iron, Offers High-Purity	Aug.	196
Iron Castings, Hot Forging and Rolling of	July	86
Iron Ore, Plans Upgrading of Southern	May	245
It's Time To Cut Waste (Ed)	Feb.	85

J

J & H Products Co. Offers Vibration Dampener	June	276
Jaeger Machine Co. Offers Tractor Shovel	May	392
Jar-Squeeze Machine, Announces	May	434
Jarrell-Ash Co. Offers Spectrometer	Dec.	213
Jeffrey Mfg. Co. Features Mold Conveyor	Aug.	196
Jeffrey Mfg. Co. Offers Belt Idler	Nov.	237
Jessop Steel Co. Uses Cast-to-Shape Stainless Molds (FD)	Nov.	230
Jet Type Oil Burners in Furnace Hood (FD)	May	236
Jig Holds Castings in Grinding Machine Operation	Jan.	156
Jig Holds Parts for Radiography, Universal	Jan.	202
Johns-Manville Announces Oil Seal	Feb.	225
Johnson-March Corp. Offers Dust Removal System	June	265
Johnson-Williams Ltd. Offers Gas Alarm	Sept.	258
Jones, C. Walker, Co. Makes Safety Survey	Mar.	238
Jones Metal Products Co. Offers Lamp Reflector	Feb.	242
Jones, W. A., Foundry & Machine Co. Offers Reducer	Aug.	207
Jordan Electronic Sales Inc. Offers Detector	Mar.	288
Joy Mfg. Co. Offers Suspension Idler	Oct.	240

K

K-G Equipment Co. Offers Pressure Regulator	May	420
K-W Battery Co. Offers Replacement Battery	Nov.	254
Kaiser Aluminum & Chemical Corp. Develops Hugh Die Casting Machine (FD)	Aug.	181
Kaiser Aluminum & Chemical Sales Inc. Offers Alloys	Nov.	257
Kalamazoo Mfg. Co. Offers Fire Fighter	Sept.	258
Kasson Die & Motor Corp. Offers Arc Welder	Sept.	252
Kearney, Quintin J. Offers Motor Base	Mar.	291
Kennedy, Robert E. Scholarship Fund, Establishes	Mar.	252
Kensington Steel Co. Tests Arc Furnace Control	Oct.	256
Keokuk Steel Casting Co. Describes Operations	Oct.	225
Keystone Grey Iron Foundry Co., Cookware Castings at	Sept.	186
Kindt-Collins Co.		
Coating, Announces Pattern	Mar.	295
Lumber, Announces Pattern	Dec.	206
Pattern Glue, Develops	Oct.	255
Sheet Wax, Announces	Apr.	230
Kinetic Engineering Co. Offers Leak Detector	Sept.	252
Klaas Machine & Mfg. Co. Offers End Dump Truck	Sept.	260
Kohler Co. Announces Electric Plant	Dec.	207
Kragor Corp Offers Insulating Cement	May	404
Kropp Forge Co. Installs Huge Drop Forge Hammers	Sept.	210
Kwik-Mix Co.		
Power Hopper, Designs	June	269
Power Wheelbarrow, Offers	Jan.	226
Wheelbarrow Safety Attachment, Develops	Sept.	262

L

Labor Data, Publishes Skilled	Nov.	219
Ladle		
Definition of Bull (Q & A)	Feb.	118
How To Dry Hand (Q & A)	Feb.	116
Unit for Drying, Develops (FD)	May	236
La-Roy Industries Inc. Offers Hacksaw	Mar.	288
Lamp		
Blacklight Inspection, Offers	Jan.	226
For Baking Operations, Offers Infrared	Sept.	252
Reflector, Announces	Mar.	288
Lamson Corp. Announces Drive Take-up	Oct.	248
Late Foundry News	Jan.—Apr.	33
Late News:	May 37; June—Sept. 33; Oct. 35; Nov., Dec.,	33
Latrobe Steel Co. Develops Sandslinger Liner	June	270
Latrobe Steel Co. Offers Shot Blast Liner	May	448
Layout—Fairbanks, Morse & Co.	Oct.	104
Layout—Modern Swiss Foundry	Jan.	104
Le Roi Co. Offers Front End Loader	May	399
LeTourneau, R. G., Inc. Offers Hoist	Nov.	241
Lead in Cupola Scrap Does not Harm Castings	May	316
Leakers in Gray Iron Castings, Controlling	Mar.	214
Leather Preservative, Offers Silicon	Apr.	248
Lebanon Steel Foundry		
Pickling Castings at	Dec.	135
Scholarship, Establishes	Nov.	167
Steel Casting Brochure, Issues	July	178
Lectromelt Furnaces of Canada Installs Arc Furnace	Jan.	155
Lehigh Valley Foundrymen's Association Elects Officers	Jan.	188
Leiman Bros. Inc. Offers Sand Blast Machine	Nov.	236
Lenses, Announces Plastic Safety	Mar.	287
Let's Talk Castings! (Ed)	Aug.	69
Lewis-Shepard Co. Offers Truck Attachment	Feb.	244
Lexsuco Inc. Announces Roof Maintenance Unit	Nov.	241
Lift, Announces Telescopic	Sept.	249
Lift, Offers Maintenance	Mar.	286
Light		
Automatic Standby, Offers	July	218
Electric Signal, Announces	Sept.	250
Inspection, Offers Magnifying	Aug.	206
Yard, Develops	Jan.	227
Light Metals and Alloys, ASTM (Data Sheet)	June	170
Lighting, Announces Emergency	June	276
Lighting Control, Develops	Feb.	244
Lighting Unit, Offers Auxiliary	Feb.	242
Lima Electric Motor Co. Offers Motor	Jan.	222
Lincoln Engineering Co. Offers Coupler	Feb.	245
Lincoln Tunnel, Cast Segments Form Shell of	Feb.	144
Linde Air Products Co. Offers Release Agent	Mar.	286
Linear Shrinkage, Several Factors Influence	Jan.	100
Liners		
Centrifugal Casting of (Q & A)	Mar.	126
For Airless Blast Cleaning, Offers	Oct.	253
For Sandslingers, Develops Steel	Sept.	260
For Shot Blast Equipment, Offers	May	448
Sandslinger, Announces	June	270
Splotchy Areas Appear on Cylinder (Q & A)	June	122

	Issue	Page
Link-Belt Co.		
Apron Conveyor, Announces	Mar.	281
Coupling, Announces Geared Flexible	Apr.	245
Roller Bearings, Offers	June	265
Speed Drive, Develops	Feb.	236
West Coast Facilities, Expands	Aug.	170
Lintern Corp. Develops Cab Air Conditioner	Jan.	222
Lithium Corp. of America Begins Expansion	Aug.	168
Load Unit System, Offers	Feb.	235
Loader		
All-Purpose Front End, Announces	Mar.	281
Four-Wheel Drive Front, Offers	Sept.	260
Front End, Announces	Oct.	252
Rubber-Tired Front End, Offers	Nov.	243
With High Under Clearance, Offers	Feb.	224
With Torque Converter Transmission, Offers	May	399
Loading System, Announces Dock Board	Feb.	247
Lobdell United Co. Offers Tool Dressing	May	426
Locker, Announces Clothes	Nov.	249
Los Angeles Foundries Control Air Pollution	Feb.	264
Love Bros. Adapts Trailer to Platform Truck (FD)	Mar.	158
Lubricant, Offers High Heat	Dec.	207
Lubricator		
Automatic Conveyor, Designs	Sept.	260
Conveyor, Develops	May	408
Oven Chain, Develops	Oct.	251
Lufkin Rule Co. Announces Steel Beam Trammel	Jan.	230
Lug-All Co. Offers Winch Hoist	Dec.	213
Lumber, Announces Pattern	Dec.	206
Lynchburg Foundry Co. Adds Shell Mold Foundry	Sept.	33

Mc

McCulloch Motors Corp. Develops Die Casting Control	May	339
McGowan Co. Issues Best Match Book of Year	June	162
McGrath, M. E., Co. Offers Masonry Cutting Blade	June	272

M

M & E Mfg. Co. Announces Direct-Drive Fan	July	208
M & E Mfg. Co. Offers Exhaust Fan	Mar.	292
M-B Corp. Offers Line Marker	June	278
Machinability, Annealing Improves Gray Iron	Jan.	110
Machinability, Graphitizing Agents Increase (Q & A)	Feb.	116
Machine & Metal Evening Trade School, Foundry Course at Sept.		34
Machine Tool Table, Metal Penetrates Cores on (Q & A)	Feb.	115
Machinery & Allied Products Institute Offers Depreciation Analysis	July	245
Machinery & Allied Products Institute Studies Depreciation	Feb.	158
Machinery and Equipment Maintenance (Ed)	Mar.	101
Machining Aids Finishing of Intricate Castings (FD)	Mar.	158
Mackintosh-Hemphill Co. Designs Slag Pots	July	178
Mackintosh-Hemphill Co. Honors Veteran Employees	Dec.	150
Magic Chemical Co. Offers Sheeting	Feb.	232
Magline Inc. Announces Dock Board System	Feb.	247
Magline Inc. Announces Magnesium Hand Truck	Aug.	196
Magnaflux Corp.		
Inspection Kit, Designs	Oct.	247
Inspection Unit, Offers Conveyorized	Apr.	231
Inspection Material, Offers Fluorescent	June	265
Magnesium		
Close Control in Die Casting	May	339
Die Casting	Feb.	102
Making Alloy Sand Castings of	Jan.	92
Sand Foundry Produces Varied Castings of	Mar.	102
Magnesium Association Plans Annual Meeting	Nov.	33
Magnesium Molding Sand	Nov.	138
Magnet, Announces Battery Operated Lifting	Nov.	242
Magnet, Designs Spout	Sept.	252
Magnet Foundry, Electric Operation Features	Jan.	86
Magnus Chemical Co. Designs Wetting Agent	Oct.	254
Main Products Corp. Offers Pulley Lagging Method	Apr.	238
Maintenance, A Plan for Productive	Sept.	122
Maintenance of Molding Machines and Core Blowers	Feb.	100
Makemson, Tom Dies	July	174
Male Die, Casting Aluminum (Q & A)	Apr.	132
Malleable Founders' Society		
Accident Prevention Contest, Sponsors	Nov.	174
Annual Meeting, Holds	Aug.	152
Central Foundry Division, Directors Visit	Nov.	170
General Industry Meeting, Holds	Nov.	232
Market Development Conference, Holds	June	173
National Malleable's Cleveland Works, Meets at	Mar.	218
Mallinckrodt Chemical Works Describes Rare Earths (FD)	Oct.	176
Malleable Founders' Society		
Safety Contest Award, Gives	July	180
Safety Contest Papers, Announces	Feb. 106; Mar.	256
Safety Contest Winners, Names	Apr.	175
Malleable Foundry, Molding Sand Practice in the	Nov.	126
Malleable Iron Castings, Cracks Appear in (Q & A)	Feb.	114
Malleable Iron Fittings Co. Issues Anniversary Book	Nov.	160
Malleable Iron Fittings Co. Reaches 100th Year	Apr.	256
Mallet, Announces Soft-Faced	July	208
Man-to-Man: Jan. 146; Feb. 180; Mar. 150; Apr. 156; May 262; June 198; July 177; Aug. 146; Sept. 178; Oct. 164; Nov. 164; Dec. 166		
Management, Booklet Explains Reduction of Load on	Dec.	179
Manganese Bronze Gating Problems	Apr.	128
Manistee Iron Works Builds Huge Machine Tool Casting	June	162
Manning, Maxwell & Moore Inc. Offers Hoist	Nov.	255
Marietta Concrete Corp. Opens Laboratory	Apr.	229
Marion Malleable Iron Works Modernizes	Sept.	108
Marker, Announces Hand-Propelled Line	June	278
Market for Castings under Normal Conditions (Ed)	Jan.	85
Market Forge Co. Offers Load Unit System	Feb.	235
Martin-Decker Corp. Announces Hook Scale	Nov.	248
Martin-Decker Corp. Offers Indicator	Apr.	245
Martin Engineering Works Offers Corebox Sealer	Oct.	241
Massachusetts Institute of Technology		
Course on Corrosion Problems, Plans	Apr.	224
Industrial Photoelasticity Course, Offers	June	235
Light Metals Conference, Holds	Oct. 178; Nov.	260
X-ray Diffraction Course, Announces	May	255
Matchplates		
Of Resin-Based Compound, Announces	July	220
Plaster Molding Data for, Wants (Q & A)	Sept.	127
Pressure-Cast Aluminum, Discusses (FD)	Apr.	206
Pressure-Cast Aluminum, To Make (Q & A)	Mar.	124
Pressure Casting Procedure for, Wants (Q & A)	Sept.	128
Material Handling Conference, Holds	Dec.	189
Material Handling Institute Announces Show	July	34
Materials Handling		
In Modern Foundry, Importance of	Aug.	70
Inventory of Equipment for	May	155
Overhead Handling Increases Production	Nov.	221
Mathews Conveyer Co. Plans Expansion	Apr.	162
Mechanical Air Controls Inc. Offers Air Valve	May	420
Mechanical Engineer, The	Jan.	98
Mechanical Handling Raises Foundry Efficiency	May	362
Mechanical Industries Inc. Offers Filter	Oct.	242
Mechanical Products Corp. Offers Seal Plug	June	274
Mechanical Testing Terms (Data Sheet)	July	231
Mechanization		
At Auburn Foundry Inc.	July	78
At Indiana Brass Co.	Aug.	212
Developments in Foundry	Aug.	70
Meehanite Metal Corp. Develops Nodular Iron Process	Sept.	33
Meehanite Metal Corp., Hot Working Iron Castings at	July	86
Meeting Calendar, Technical Societies: Jan. 140; Feb. 156; Mar. 147; Apr. 164; May 230; June 186; July 174; Aug. 144; Sept. 175; Oct. 156; Nov. 167; Dec. 204		
Mel-Rod Mfg. Co. Offers Fire Safety Device	Mar.	294
Melt Quality, Understanding of (FD)	Mar.	158
Melting		
And Pouring, Equipment for Small Foundry	May	182
Equipment for Heat Treating and	May	152
In the Reverberatory Furnace, Iron	Mar.	224
Radioactively Tagged Iron Ore for Cupola (FD)	Apr.	206
Melting Frequency's Effect on Aluminum Alloys	Aug.	84
Men of Industry Jan. 120; Feb. 121; Mar. 130; Apr. 137; May 204; June 127; July 112; Aug. 104; Sept. 132; Oct. 140; Nov. 146; Dec. 112		
Mercury for Investment Mold Patterns, Uses (FD)	Feb.	164
Merit Products Inc. Offers Grinding Wheel	Sept.	244
Mesta Machine Co. Produces Huge Casting	Dec.	150
Metal Analysis, Spectrographic	Sept.	112
Metal Removal Co.		
Grinder, Offers Hand	May	446
Wheel, Offers All-Purpose Abrasive	July	210
Wheel, Offers Hard Resin Grinding	Nov.	238
Metallizing Co. of America Offers Spray Gun	Dec.	218
Metallizing Material, Offers	Mar.	295
Metallurgical Engineer, The	Jan.	98
Metals Casting Conference, Holds	Dec.	238
Meteo Processing Corp. Offers Shell Mold Equipment	Oct.	250
Meter, Announces Pocket-size pH	Oct.	241
Meter, Offers Portable pH	July	220
Methods, Small Foundry	Oct.	115
Metropolitan Brass Founders Association		
Anniversary Celebration, Plans	Nov.	184
Chaplet Film, Views	July	195
Officers, Elects	Apr.	224
Metropolitan Chapter of the AFS		
East Coast Conference, Sponsors	May	304
Lecture Course, Plans	Nov.	33
National Officers' Night, Holds	Apr.	218
Round-table Discussions, Holds	May	382
Mexico City Chapter of the AFS Elects Officers	June	240
Mexico City Chapter of the AFS Studies Cupola Design	Aug.	189
Michiana Chapter of the AFS Holds Metals Conference	Dec.	238
Michiana Chapter of the AFS Plans Metals Conference	Oct.	217
Michigan Oven Co. Offers Kiln Type Oven	Aug.	207
Michigan Regional Foundry Conference		
AFS Chapters Hold	Dec.	129
AFS Chapters Plan	May 336; Sept.	235
Program, Announces 1954	Oct.	222
Michigan State College Holds Career Carnival	Mar.	162
Michigan State College Student Chapter of the AFS		
Membership Campaign, Opens	June	145
Officers, Announces	Sept.	232
Television Show, Presents	July	244
Michigan Tool Co., Huge Gear Cutting Machines at	June	162
Micrometer, Announces Direct Reading	Nov.	242
Microscope, Develops X-ray (FD)	Dec.	156
Microscope Reader, Offers Low Cost	Jan.	232
Microscope with Electrostatic Lens, Describes (FD)	Oct.	176
Microscopy of Metals, Issues British	Sept.	158
Midvale Material Handling Equipment Co. Personnel	Feb.	150
Midwest Foundry Co. Simplifies Shell Molding Operation	Sept.	158
Miller Motor Co. Offers Stock Cylinders	Apr.	237
Milwaukee Air Gun Co. Offers Heavy Duty Gun	Dec.	212
Mine Safety Appliances Co.		
Faceguard, Announces	June	274
Goggles, Announces Visor	Sept.	254
Indicator, Offers Smoke Density	Dec.	206
Respirator, Offers	May	420
Minneapolis-Honeywell Regulator Co. Announces Switch	Oct.	242
Minneapolis-Honeywell Regulator Co. Offers Switch	Aug.	197
Minnesota Mining & Mfg. Co.		
Belt, Announces Abrasive	Jan.	214
Grinding Disc, Offers Abrasive	Nov.	256
Surfacing for Pulley Lagging, Offers	Sept.	245
Mitchell Industrial Tire Co. Offers Tubeless Tire	Sept.	246
Mitchell Radiation Products Corp. Offers Viewer	Nov.	256
Mixer Tempers Sand Automatically, Continuous	Nov.	169
Moak Machine & Tool Co. Offers Band Saw	Aug.	206
Modernization		
At Canadian Car & Foundry Co.	Sept.	146
At Empire Steel Castings Inc.	Dec.	94
At Fairbanks, Morse & Co.	Oct.	104
At Marion Malleable Iron Works	Sept.	108
Keeping Pace with (Ed)	May	111
Of Small Foundries	Oct.	115
Modernize Your Foundry, How To	May	132
Modernize Your Thinking (Ed)	Sept.	101
Moisture Trap, Announces	Nov.	238
Mo-Kan Chapter of the AFS		
Christmas Party, Holds	Mar.	272
Cupola Operation, Considers	Dec.	182
Officers, Announces	Nov.	184
Quick Baking of Cores, Considers	Jan.	190
Moisture Meter, Announces	Mar.	288
Mold Blower, Offers Low Pressure	May	393
Mold Coating Materials, Wants (Q & A)	Aug.	102
Mold Factors on Casting Defects, Influence of (FD)	Aug.	181
Mold Production Figures, Questions (Q & A)	Oct.	135

	Issue	Page
Molding		
Developments in High-Pressure	Apr.	111
Difficulties of Stack (Q & A)	Oct.	134
Equipment for Coremaking and	May	148
Equipment for Small Foundry	May	164
Preparation of Sand for	May	242
Molding Machine		
And Core Blower, Maintenance of	Feb.	100
Compacts Sand at Sprue Top of (Q & A)	July	107
For Lightweight Castings, Offers	May	422
Semiautomatic Jolt Squeeze, Designs	July	209
Speeds Engine Block Production	Oct.	152
Swiss Twin, Designs	May	257
Two Station Strip, Offers	Aug.	204
Molding Method, Develops Multiple (FD)	Nov.	230
Molds		
Cast-to-Shape Stainless, Perfects (FD)	Nov.	230
Method of Preparing Plaster (Q & A)	Apr.	131
Plastic-Carbon Material for, Develops (FD)	Feb.	164
Quick Repair of	Dec.	154
Monroe Co. Offers Floor Resurfacer	Jan.	232
Monroe Co. Offers Non-Skid Coating	May	444
Moore Lubricator Co. Offers Conveyor Lubricator	May	408
Morrison Products Inc. Announces Tool Bench	Jan.	222
Morse Chain Co. Announces Overload Protector	May	393
Mothballing a Steel Foundry	Oct.	194
Motor		
AC Induction, Offers Squirrel Cage	May	436
Electric, Offers Totally Enclosed	Feb.	235
Enclosed Fan Cooled, Offers	Jan.	222
Fan-Cooled, Announces	Mar.	286
Induction, Offers	May	412
Normal Speed Electric, Announces	May	399
Squirrel-Cage Induction, Announces	Apr.	245
Weather-Protected, Develops	Aug.	202
Motor Base, Announces Steel	Mar.	291
Motor Drive, Offers Variable-Speed	Nov.	236
Moulder's Friend Offers Sand Conditioner	Apr.	249
Muffler, Announces Exhaust	Sept.	251

N

Nameplates, Sand Mixture for Aluminum (Q & A)	May	198
National Castings Council Holds Cleveland Meeting	June	159
National Engineering Co.		
Sand Mixer, Announces	Aug.	198
Sand Muller, Offers	Apr.	230
Sand Reclamation Unit, Shows	May	268
National Foremen's Institute Issues Supervisor's Aid	Dec.	224
National Foundry Association		
Administrative Council Meets	Mar.	264
Annual Meeting, Holds	Dec.	123
Annual Meeting, Plans	Sept.	234
Labor Practices, Surveys	Sept.	222
Pension Plan Data, Issues	Dec.	224
Regional Meeting in Milwaukee, Holds	Aug.	214
National Malleable & Steel Castings Co. Reduces Dust	Aug.	141
National Metal Congress		
Foundry Exhibits of the 1953	Jan.	152
Plans 1954	Sept.	162
Program, Announces 1954	Oct.	162
Wide Display of Castings at 1954	Dec.	240
National Metal Trades Association Plans Conference	June	284
National Radiator Co. Offers High-Purity Iron	Aug.	196
National Research Corp. Adds Titanium Casting Furnace	Nov.	33
National Research Corp. Studies Titanium Casting	Feb.	94
National Safety Council		
Accident Rate Figures, Reports	Aug.	33
Human Relation Training Films, Offers	Mar.	238
Ideas for Safety Program, Offers	Mar.	235
Public Service Awards, Presents	Dec.	189
Safety Booklet for Small Firms, Issues	Sept.	170
Safety Booklet for Workers, Issues	Dec.	147
Safety Devices Book, Offers	Oct.	239
Safety Films, Offers	Dec.	251
Steel Founders' Society of America, Cites	Dec.	161
Woodworking Manual, Publishes	July	122
National Supply Co., Wet Sand Reclamation at	Oct.	112
Natural Sands of Mid-America	Nov.	114
Naval Research Laboratory Studies Gating Systems	Apr.	102
Naval Research Laboratory Studies Vacuum Degassing	Dec.	78
New England Foundrymen's Association		
Cupola Refractory Linings, Studies	Apr.	208
Officers, Announces	Mar.	274
Pressure Molding, Considers	July	198
Smorgasbord Dinner, Enjoys	Aug.	189
New England Regional Foundry Conference, Holds	Dec.	158
New England Regional Foundry Conference, Plans	Oct.	220
New Plastic Corp. Announces Soft-Faced Mallet	July	208
Newage International Inc. Offers Grinder	Mar.	282
Newage International Inc. Offers Piping	July	208
Newman Mfg. & Sales Co. Offers Bridle	Dec.	207
News Views: Jan. 134; Feb. 138; Mar. 142; May 268; June 162; July 180; Aug. 174; Sept. 210; Oct. 230; Nov. 172; Dec.		150
Nickel Addition Eliminates Leakers in Brass Casting (FD)	June	160
Nickel Additions for Railroad Castings (Q & A)	Sept.	127
Nickel Cadmium Battery Corp. Offers Light	June	276
Nickel-Chromium Alloy List, Revises	July	240
Nodular Iron		
Feeding and Solidification of Gray and	June	108
Notch Ductility of	Sept.	114
Solidification of (FD)	Aug.	181
Noise Abatement Symposium, Holds	Aug.	232
Noise, Combating Effects of	Apr.	112
Noise Control, Publishes Reports on	Apr.	33
Noise Reduction System, Offers	Feb.	238
Nonferrous Founders' Society		
Annual Meeting, Holds	June	190
Annual Meeting, Plans	May	222
Boston Chapter Considers Cast Aluminum	Mar.	276
Boston Chapter Considers Pressure Molding	June	246
Boston Chapter Considers Shell Molding Equipment	May	382
Boston Chapter Elects Officers	Feb.	216
Cleveland Chapter Elects Officers	July	197
Cleveland Chapter Holds Annual Clambake	Dec.	188
Cleveland Chapter Holds Annual Outing	Aug.	186
Cleveland Chapter Plans Cost Clinic	Mar.	270
Cleveland Chapter Views Gating Film	May	382
Facilities Survey, Sets Deadline for	Aug.	34
Nonferrous Foundry, Time Savers in the	Apr.	202
Nonferrous Metals, Vacuum Degassing of	Dec.	78
North American Mfg. Co.		
Burner, Announces Air Heater Gas	May	418
Burner for All Types of Furnaces, Announces	Nov.	241
Burner for High Temperature Furnace, Offers	June	274
Burner, Offers Manual or Automatic Control	Mar.	281
Radiant Tube Burner, Announces	Jan.	219
Northeastern Ohio Chapter of the AFS		
Annual Outing, Holds	Sept.	232
Apprentice Contest Prizes, Distributes	June	242
Convention Committees, Cleveland	May	128
"D" Molding Process, Considers	Mar.	272
Foundry Modernization, Studies	Oct.	214
Gating Design Film, Views AFS	Apr.	215
National Officers Meeting, Holds	May	368
Officers, Elects	Aug.	197
Safety in the Foundry, Studies	Dec.	186
Northern California Chapter of the AFS Elects Officers	Aug.	184
Northwest Regional Foundry Conference, Holds 1953	Jan.	162
Northwest Regional Foundry Conference, Plans 1954	Oct.	220
Northwestern Pennsylvania Chapter of the AFS		
Cores and Binders, Considers	Feb.	212
Cupola Operation Considers	Dec.	186
Gating and Risering, Considers Methods of	Jan.	190
High Pressure Molding, Studies	June	236
Metal Film Has Wide Distribution	Apr.	181
Officers, Elects	July	195
Pickands-Mather Erie Plant, Visits	Apr.	218
Norton Co. Designs Grinding Wheel	Aug.	206
Notch Ductility of Nodular Irons	Sept.	114
Nurserymen's Association Holds Plant America Contest	June	196

O

Oakite Products Inc. Offers Metal Cleaner	June	264
Obear, W. F., & Son Offers Metal-Cutting Saw	Jan.	214
Obituary: Jan. 138; Feb. 162; Mar. 244; Apr. 186; May 266; June 194; July 226; Aug. 162; Sept. 192; Oct. 224; Nov. 224; Dec.		143
Ohio Electric Mfg. Co. Offers Lifting Magnet	Nov.	242
Ohio Malleable Iron Co., Dayton Malleable Iron Co. Acquires	Feb.	256
Ohio State Student Chapter of the AFS Views Film	Dec.	182
Oil Seal, Announces	Feb.	225
Oil Separator, Announces	May	422
Oliver Machinery Co. Offers Band Saw	May	430
Oliver Machinery Co. Offers Segment Gage	July	209
Olivine Production, Starts	Nov.	221
One-Man Foundry Competes with Brake Shoe Plant	Mar.	241
Ontario Chapter of the AFS		
Effect of Hygiene on Foundry Costs, Studies	July	196
Ladies' Night, Holds	Aug.	184
Plastic Patterns, Considers	Nov.	200
Sand Control, Considers	Apr.	222
Steel Company of Canada, Visits	Feb.	209
Open House Establishes Good Community Relations (Ed)	Dec.	77
Oppelm Co. Announces Hardness Tester	Jan.	231
Oregon Chapter of the AFS Considers Casting Defects	Dec.	181
Oregon Chapter of the AFS Studies Sand Fundamentals	Nov.	186
Osbrink, R. H., Mfg. Co., Making Sand Castings at	Jan.	92
Ottawa Silica Co. Honors Veteran Employees	Mar.	255
Oven		
Dielectric Core, Offers	June	264
Gas or Electric Batch, Announces	Dec.	206
Kiln Type, Announces	Aug.	207
Overhead, Discusses Foundry (Q & A)	Jan.	118
Overlay Material, Develops	May	416
Overload Protector, Announces	May	393
Oxidation of Aluminum-Magnesium Alloys (FD)	May	236

P

pH Value of Molding Sands	June	116
P-K Industries Inc. Offers Hose Valve	Dec.	213
Pacific Transducer Corp. Offers Microscope Reader	Jan.	232
Pacific Welding Alloys Mfg. Co. Announces Electrode	Nov.	243
Pacific Welding Alloys Co. Offers Electrode	Sept.	254
Paint		
For Exhaust Stacks, Application of (FD)	Dec.	156
Heat Resistant, Develops	Oct.	245
Plastic Liquid Nonskid, Announces	Jan.	219
Spot-Coat Cores with Aluminum (Q & A)	Sept.	126
Painting of Foundry Buildings (Q & A)	Aug.	100
Paliton Inc. Announces Pallet Truck	June	272
Pallet, Announces Steel	Oct.	242
Pallet Hardware, Announces	Oct.	252
Palmer-Shile Co. Announces Skid Box	Dec.	206
Palmer-Shile Co. Announces Stacking Box	Aug.	196
Paltier Corp.		
Box, Offers Stacking Shipping	Dec.	219
Hardware, Announces Pallet	Oct.	252
Rack, Announces Pallet	Apr.	244
Pangborn Corp.		
AFS Grant To Assist Foundry Educational Work	July	122
Barrels, Announces Cleaning	Sept.	245
Centrifugal Wheel Blasting Equipment, Adds	Feb.	138
Dust Collector, Announces	Mar.	289
Dust Collector, Develops Wet	Sept.	262
Employees Commemorate Golden Anniversary of	Oct.	230
Golden Anniversary, Marks	Sept.	208
Golden Anniversary, Plans	Jan.	253
Liner, Announces Alloy	Oct.	253
Veteran Employees, Honors	Mar.	142
Panel Coil in Aluminum, Casting In (Q & A)	June	124
Paper, Offers Photcopying	Mar.	293
Parker Sweeper Co. Offers Floor Sweeper	June	278
Parting Agent for Shell Molding, Offers	July	209
Parting Agents for Plaster Molding (Q & A)	Dec.	110
Partlow Corp. Offers Pilot Burner	Apr.	244
Pattern Letters, Develops	Oct.	240
Pattern Plate, Announces Aluminum	Apr.	231
Patternmakers, Training Woodworkers as (Q & A)	Aug.	98
Patterns		
Bronze Name Plate, To Make (Q & A)	Feb.	118
For Steel Castings, Shrinkage Allowance on	Jan.	100
Non-Shrink Plastic, Offers	Oct.	254
On Squeezer Board, Simplifies Mounting of	Mar.	248

	Issue	Page
Reinforcement and Safe Rapping of	Dec.	154
Rubber Corebox, Develops (FD)	Nov.	230
Thickening Castings without Changing	May	333
To Control Temperature of (Q & A)	May	200
Wants Metal Coating for (Q & A)	Aug.	102
Pearlitic Rim, Malleable Has (Q & A)	Oct.	138
Peerless Photo Products Inc. Offers Paper	Mar.	293
Penco Engineering Co. Offers Ramp	Mar.	294
Peninsular Grinding Wheel Sales Corp. Offers Film	July	237
Penn Metal Corp. Offers Clothes Locker	Nov.	249
Penn-Rillton Co. Correction	May	456
Penn-Rillton Co.'s New Plant, Dust Control at	Aug.	164
Penn State Student Chapter of the AFS Studies Cores	Mar.	262
Pennsylvania Optical Co. Offers Chippers' Goggles	Dec.	219
Pennsylvania Pump & Compressor Co. Offers Valves	Mar.	280
Pennsylvania Salt Mfg. Co. Offers Floor Coating	May	438
Permanent Molds		
Casts Eaves Troughs in (FD)	Jan.	176
Coatings for, Wants (Q & A)	Sept.	130
Facings for (Q & A)	Apr.	132
Graphite Mold Coated with Aluminum Wash in (FD)	Aug.	181
How To Design (Q & A)	July	106
To Control Temperature of (Q & A)	Aug.	102
Wants Coating for (Q & A)	Aug.	98
Wants Data on (Q & A)	May	202
Phenolic Resin Core Binders, Properties of	Dec.	100
Philadelphia Chapter of the AFS		
Carbon Control, Discusses Cupola	Apr.	222
Coleman Scholarship, Establishes William B.	Dec.	168
East Coast Conference, Sponsors	May	304
Foundry Safety, Considers	July	204
Fracture Tests, Considers	Mar.	262
Future of the Foundry Industry, Studies	Dec.	182
Molding and Core Sands, Considers	Feb.	214
Steel Fracture Behavior, Studies	May	374
Phosphorus' Effect on Galvanizing Embrittlement (FD)	Mar.	158
Photocopier, Announces German-Made	May	408
Pickling Castings at Lebanon Steel Foundry	Dec.	135
Pig Alloy, Announces	Nov.	257
Pig Iron Production and Consumption: Jan. 144; Feb. 148; Mar. 156; Apr. 160; May 250; June 166; July 158; Aug. 132; Sept. 238; Oct. 234; Nov. 178; Dec. 196		
Pilot Burner, Announces	Apr.	244
Pinholes in Brass and Gun Metal, Flour Causes (FD)	Sept.	160
Pinholes Occur in Cast Iron Castings (Q & A)	Dec.	108
Pipe Bend in Independence Hall, Finds	June	162
Pipe Fittings, Galvanizing of (Q & A)	May	198
Pipe, Low Sand Content Causes Leakers on Sewer (Q & A)	Sept.	127
Piping, Offers Industrial	July	208
Piston Ring Pots Are Porous (Q & A)	Jan.	118
Pittsburgh Foundrymen's Association		
Fly Ash Collection, Considers	May	374
New Era in Melting, Considers	Mar.	276
Officers, Elects	July	201
Patent Requirements, Considers	Apr.	210
Sand Control, Considers	Dec.	184
Why Castings Are Lost, Considers	Jan.	180
Plant Maintenance Show, Plans	Nov.	226
Plaster		
Applications for Expansion, Cites (FD)	Sept.	160
For Nonferrous Metals, Offers New	Nov.	252
Molding with (Q & A)	Sept.	127
Plaster Molds, Noncorrosive Alloy for (Q & A)	July	107
Plasti-Kote Inc. Announces Metal Primer	Mar.	280
Plastic Metal, Announces	May	418
Plastic Tool Co. Announces Patterns	Oct.	254
Plastics Engineering Co. Offers Shell Mold Resins	June	265
Plug, Offers Quick Seal	June	274
Polishing Machine, Announces	Aug.	204
Polishing Machine, Offers	Oct.	255
Polishing Stand, Offers	May	442
Polishing Table, Offers Specimen	Apr.	250
Porosity in Castings	Dec.	79
Porter-Cable Machine Co. Offers Band Saw	May	446
Positioner, Announces Work	Feb.	234
Pot, Offers Heat Treating	Aug.	196
Pot Castings, Discusses Molding of (Q & A)	Jan.	116
Potentiometer, Announces Portable	Sept.	249
Pouring Cup, Swedish Foundry Develops Strainer (FD)	Jan.	176
Pouring Equipment, Small Melting and	May	182
Pouring Temperature for Aluminum and Nickel Silver (Q & A)	Nov.	140
Power Steering for Fork Lift Trucks, Offers	Mar.	292
Power Unit for Electric Truck, Offers	Sept.	262
Precision Casting Process		
At AiResearch Mfg. Co.	Apr.	124
Design and Dimensional Control for	Sept.	120
Of Bronze in Plaster Molds (Q & A)	July	107
Shaw Processes Ltd., Develops	Sept.	242
Precoating Process, Announces	Sept.	244
Press, Offers Wax Injection	Aug.	198
Presstite Engineering Co. Offers Mold Sealer	May	432
Price Controls May Be Ahead, Foundry	July	77
Prices—Foundry Metals and Coke	Jan.-Dec.	34
Prime-Mover Co. Offers Mobile Service Station	Oct.	251
Prime-Mover Co. Offers Snow Plow Attachment	Nov.	236
Primer, Announces Metal	Mar.	280
Prizer-Painter Stove Works Expands Castings Market	Sept.	186
Problems in the Brass Foundry, Solving	Sept. 106; Oct.	130
Progress, AFS Show Demonstrates Industry (Ed)	June	85
Progressive Policies Feature Steel Foundry	Apr.	108
Propeller, Develops Light Alloy for	Dec.	156
Propeller Hub, Shrinkage in (Q & A)	June	120
Pulley Lagging Method, Announces	Apr.	238
Pulley, Metal Mold for Small (Q & A)	Feb.	115
Pulmosan Safety Equipment Corp. Offers Respirator	Feb.	240
Pump, Announces Fuel Oil	Apr.	242
Purdue University		
Metals Casting Conference, Holds 1954	Dec.	238
Metals Casting Conference, Plans 1954	Oct.	217
Quality Control Course, Plans	May	240
Purifier for Pneumatic Equipment, Offers	Oct.	250
Pyramid Corp. Offers Volt-Ampere Tester	May	406
Pyrometer		
Automatic, Announces	June	270
For Precision Measurements, Offers	Sept.	256
Immersion and Surface Type, Develops	July	218
Pocket, Develops	Sept.	251
Pyrometer Instrument Co. Designs Optical Pyrometer	Sept.	256
Pyrometer Service Co. Offers Pyrometer	July	218
Pyrometer Test Unit, Announces	Nov.	244

Q

Quality Control in a Gray Iron Foundry	Oct.	126
Quality Control, The Foundryman Considers	Feb.	112
Questions and Answers: Jan. 114; Feb. 114; Mar. 124; Apr. 130; May 198; June 120; July 106; Aug. 98; Sept. 126; Oct. 134; Nov. 140; Dec. 106		
Quoting on Aluminum Castings	May	313

R

Rack		
Portable Pallet, Announces	Apr.	244
Portable Self-Stacking, Develops	Mar.	289
With Long Span Shelves, Offers Storage	Dec.	206
Radiation Booklet, Offers	June	178
Radioactive Products Inc. Announces Fluoroscope	Mar.	290
Radioactive Products Inc. Offers Fluoroscope	May	392
Radioactive Wristbands Protect Press Operator	Mar.	244
Radiography, Universal Jig Holds Parts for	Jan.	202
Railroad Suppliers Holds Promotion Campaign (Ed)	Aug.	69
Railroads Retrench	Sept.	33
Rain Gutters, Develops Permanent Mold Process for (FD)	Jan.	176
Ramp, Announces Magnesium Yard	Mar.	294
Rapids-Standard Co. Offers Roller Conveyor	Feb.	235
Rare Earth Residuals, Determining (FD)	Oct.	176
Rat-Tailing, Sand Expansion Causes (Q & A)	Oct.	136
Raybestos-Manhattan Inc.		
Conveyor Belt Cover, Announces	Feb.	243
V-Belt, Announces Equal Distribution	Sept.	244
V-Belt, Offers Synthetic Rubber	Mar.	281
Readers' Comment:		
ABC Articles, Enjoys	May	108
Alloys Article, Praises Cost of Special	May	102
Army Engineers Foundry	Mar.	98
Castings for Highway Use	Jan.	82
Consecutive Pages, Wants	Feb.	80
Chaplets, Fusing of	May	106
Contrast in Foundries	Dec.	72
Core Blowing at Cadillac	Feb.	82
Cost of Alloy Gray Iron	May	102
Detecting Porosity	Sept.	98
Down Time Hurts Profits	May	104
Error in Equation	Jan.	82
Error in Formula, Spots	June	82
Floating Foundries	Oct.	98
Foundry Trade Names	Dec.	72
Foundry Training Program	Sept.	98
Frustrated Killer, The	Jan.	82
Galvanizing Inserts, Suggest	Sept.	98
Gray Iron Ads Pull Inquiries	Apr.	96
High-Energy X-rays	Apr.	92
Huntington Wheel Dressers, Discusses	May	102
Index for 1954 Available	Mar.	98
Indian Foundrymen, Training	Aug.	66
January Cover, Likes	Mar.	98
"Let's Kick It Around", Discusses	May	102
Likes Appraisal of Turkey	Apr.	98
May Issue Is Attractive	June	82
Molding Sand Preparation	June	82
No More Snow Shovel	Dec.	72
October Editorial, Praises	Dec.	72
Oil May Be the Cause	Sept.	98
Orchids to the Author	Jan.	82
Patternmaker, The	Oct.	98
Questions and Answers Comment	Apr.	96
Report of Fire in Error	Mar.	98
Safety, A Boost for	Mar.	98
Safety Letters Publicity, Approves	Mar.	98
Shell Molding, Cost of	Jan.	82
Sound Pricing Essential	Sept.	98
Spot Test Identification	Aug.	66
Stopper Bolt Trouble	Feb.	80
They Use Castings	Oct.	100
Twin Molding Machine, The	June	82
Veteran Retires, A.	Jan.	82
Weather, Concerning the	June	82
What Makes a Leader?	Feb.	80
Wood Framing Is Fire Hazard	Apr.	92
Reading Crane & Hoist Corp. Offers Chain Hoist	Nov.	236
Reading Foundrymen's Association		
Accident Prevention, Considers	May	368
Conestoga Foundrymen's Association, Meets with	Dec.	186
Foundry Seminar, Holds	Nov.	189
Mechanization in Coremaking, Studies	Mar.	278
Officers, Elects	July	196
Round-table Discussions, Holds Group	Apr.	224
Ready-Power Co. Offers Gas-Electric Power Unit	Sept.	262
Record Industrial Co. Offers Paper Cap	Feb.	245
Red Cross Fund 1954	Mar.	216
Redford Iron & Equipment Co. Offers Core Blower	May	428
Reel, Announces Welding Hose	July	223
Reeves Pulley Co. Announces Speed Drive	Feb.	230
Reeves Pulley Co., Offers Variable Speed Drive	Nov.	236
Reflector, Announces Lamp	Feb.	242
Refractories in Malleable Production, Cost of	June	106
Refractories, Principles of (ABC)	Apr.	226
Refrigerator Castings Should Meet Requirements (Q & A)	May	199
Regional Foundry Conference		
Canadian AFS Chapters Hold	Dec.	202
New England Foundrymen Hold	Dec.	158
Northwest AFS Chapters Hold 1953	Jan.	162
Southeastern, Tennessee Chapter Holds	Apr.	167
Wisconsin Chapter of the AFS Holds	Apr.	153
Regulator, Announces Pipeline	May	420
Regulator for Compressed Gases, Offers	May	420
Reichhold Chemicals Inc.		
Formaldehyde Unit, Opens	Nov.	270
Resins, Offers Shell Mold	Sept.	260
Shell Molding Symposium, Holds	Feb.	138
Reiff & Nestor Co. Announces Thread Restorer	Jan.	222
Reiter, Joh. Jakob, & Co. Designs Molding Machine	May	257
Relax, How To	Apr.	178
Release Agents, Announces Shell Molding	Mar.	286

	Issue	Page
Release Agents, Offers Silicone	June	264
Reliance Electric & Engineering Co. Offers Motor	Apr.	245
Remington Rand Inc. Offers Inventory Machine	Jan.	229
Rensselaer Valve Co., Naval Survey at	Oct.	264
Repair Casting without Use of Pattern, Makes	Oct.	204
Repair Compound, Develops Epoxy Resin	Oct.	240
Repair Compound, Offers Aluminum	Sept.	259
Repair Welding, Foundry	Jan.	204
Repairing Faulty Castings	Nov.	209
Republic Rubber Division Offers All-Purpose Hose	Sept.	258
Republic Steel Corp. Offers Shipping Container	Oct.	241
Research, British Foundry	Mar.	112
Resin		
For Core Drier Fitting Slugs, Uses Epoxy (FD)	Sept.	160
In Shell Molding Operations, Use of (FD)	Feb.	164
Liquid Tooling, Develops	Apr.	232
Powdered Phenolic, Announces	Dec.	207
Pulverized Phenolic, Announces	June	265
Shell Mold, Offers	Sept.	260
Respirator		
Chemical Single Cartridge, Offers	Feb.	240
Dual-Purpose, Announces	Feb.	236
Plumbing Plant Encourages Use of	May	344
With Static-Web Dust Filter, Offers	May	420
Restrictions Are Needed, Ferrous Scrap (Ed)	Nov.	101
Reuland Electric Co. Offers Adapter End Bell	May	442
Reuland Electric Co. Offers Motor	Mar.	286
Reynolds Metals Co.		
Aluminum Data Book, Issues	Nov.	234
Aluminum Pig Alloy, Announces	Oct.	240
Aluminum Shot, Develops	July	209
Heat Treatment Manual, Offers	May	322
Noise Reduction System, Announces	Feb.	238
Paint for Exhaust Stacks, Develops (FD)	Dec.	156
Richmond Malleable Castings Co. Wins Safety Award	Jan.	161
Richmond Radiator Co. Promotes Respirator Use	May	344
Riddle for Molding Machine, Offers	Oct.	241
Riser Compounds Aid Shrink Problem (Q & A)	Jan.	115
Robbins & Myers Inc. Announces Wire-Rope Hoist	Apr.	237
Roberts & Schaefer Co. Offers Drum Dryer	Nov.	257
Rochester Chapter of the AFS		
Brass and Bronze Foundry Practice, Studies	May	371
Cupola Operation, Considers	Dec.	188
Metallurgy of Cast Iron, Considers	Jan.	186
Officers, Announces	June	246
Resin-Bonded Cores, Considers	Mar.	268
Shell Molding Patterns, Considers	Feb.	216
Rockwell Mfg. Co. Redesigns Grinder	July	215
Roll Maker Modernizes Foundries	Mar.	246
Rolling Iron Castings	July	86
Rollway Bearing Co. Offers Spacer Sleeve	May	412
Roof Maintenance Kit, Offers	Nov.	241
Roofing, Announces Corrugated	May	408
Roofing, Offers Enameled Steel	Feb.	224
Roots-Connersville Blower Celebrates Centennial	Apr.	164
Roots-Connersville Blower Marks 100th Anniversary	June	200
Ross Operating Valve Co.		
Air Control Valve, Develops	Oct.	248
Air Control Valve, Redesigns	June	270
Four-Way Air Valve, Develops	July	224
Ross, J. O., Engineering Corp. Holds 25-Year Dinner	Jan.	202
Ross-Meehan Foundries Mark 65 Years of Progress	Aug.	90
Rotor Tool Co. Offers Portable Grinder	May	422
Rotor Tool Co. Offers Vertical Grinder	Nov.	237
Royer Foundry & Machine Co. Announces Sand Cleaner	Aug.	197

S

SKF Industries Inc. Makes Giant Bearing	May	268
Safety		
Is Everybody's Business	Feb.	106
Rules for Plant	Mar.	120
Why Take Chances with (Ed)	Nov.	77
Works If You Work at It!	Aug.	80
Safety Clothing & Equipment Co. Marks 30th Year	Mar.	302
Safety Program, Individual Help in a	Feb. 107; Mar.	258
Safety Program, Operation of a	Feb. 190; Mar.	256
Safety Vulcanizer Co. Offers Shell Mold Machine	July	208
Sage Equipment Co. Offers Conveyor Drive	May	444
Saginaw Valley Chapter of the AFS Studies Safety	Feb.	216
St. Louis Chapter of the AFS		
Area Foundries, Visits	Mar.	266
Casting Design, Considers	Dec.	181
Dietert Molding Process, Considers	Feb.	212
European Engineering Methods, Considers	Jan.	185
Industrial Training Values, Studies	June	238
Missouri Valley Regional Conference, Plans	Nov.	195
Officers, Elects	July	195
Spectroscopy in Foundry Control, Studies	Apr.	215
Salamander, Designs Portable	Sept.	260
Salsbury Corp. Offers Air Hammer Tool Kit	Mar.	280
Salt Bath, Razor Blade Tests Decarburization of (FD)	Mar.	158
Sampling Device, Develops Rotary Metal (FD)	Jan.	176
Sand		
At Allis-Chalmers, Air Moves the	Feb.	96
Blow in Gray Iron Casting, Causes (Q & A)	Aug.	98
Clay Content Causes Expansion Scabs in (Q & A)	Sept.	127
Developing a Synthetic (Q & A)	Apr.	134
Flowability Test for, Announces	Nov.	236
For Aluminum Patterns (Q & A)	Apr.	134
For Average Foundry, Control of	Nov.	102
For Gray Iron Valve Bodies (Q & A)	Apr.	134
For Various Sizes of Castings, Use (Q & A)	July	108
Fundamentals of Synthetic Molding	Nov.	108
In the Aluminum Foundry, Use of Molding	Nov.	134
In the Brass Foundry, Use of Molding	Nov.	130
In the Gray Iron Foundry, Use of Molding	Nov.	116
In the Malleable Foundry, Use of Molding	Nov.	126
In the Steel Foundry, Use of Molding	Nov.	122
Installs Moisture Controls for	Nov.	169
Magnesium Molding	Nov.	138
Naturally Bonded Molding	Nov.	112
Of Mid-America, Natural	Nov.	114
pH Value of Molding	June	116
Pneumatic System Handles	Sept.	200
Preparation of Synthetic	Sept.	202
Present and Past Preparation of	May	242
Rat-Tailing Due to Expansion of (Q & A)	Oct.	136
Reclamation of Wet	Oct.	112
To Determine pH Value of (FD)	Apr.	206
Variance of Moisture Content in (Q & A)	Feb.	118
Wider Use of Zircon, Discusses (FD)	Feb.	164
Sand Blaster, Announces	Nov.	236
Sand Castings Can Be Made to Close Tolerances	Jan.	92
Sand Cleaner, Offers Magnetic	Aug.	197
Sand Conditioner, Announces	Apr.	249
Sand Conditioning Equipment, Small	May	176
Sand Distribution System, Announces	Feb.	224
Sand Matches, Wants Formula for Hard (Q & A)	Sept.	130
Sand Mixer, Announces	Aug.	198
Sand Muller, Announces	Apr.	230
Sand Preparation Equipment	May	150
Sander, Announces Belt	May	410
Sander, Announces Disc	May	416
Saugus Iron Works Restoration, Dedicates	Sept. 272; Dec.	138
Saunders, Alexander, & Co. Offers Press	Aug.	198
Saw		
Adjustable Masonry, Offers	May	450
Cuts Teeth on Bevel Gear Pattern, Band	Nov.	160
High Speed Band, Announces	May	430
Left Hand Band, Announces	Aug.	206
Metal-Cutting, Announces	Jan.	214
Portable Band, Designs	May	446
Portable Power Hack, Announces	Mar.	288
Semi-Automatic Band, Announces	May	440
Variable Speed Band, Announces	Feb.	242
Scaffolding Attachment, Announces	Feb.	244
Scale		
Electronic Crane, Offers	July	223
Hydraulic Hook, Announces	Nov.	248
Small Capacity Crane, Offers	Dec.	211
Scheel Olivine Inc. Acquires H. P. Scheel Co.	Nov.	221
Scherr, George, Co.		
Gage Blocks, Announces	June	270
Gage, Develops Height	May	414
Hardness Tester, Announces	July	222
Schmidgall Mfg. Co. Offers Cutting Wheel	Dec.	212
Schumann, I., & Co. Offers Palletized Ingots	May	452
Scrap		
Criticizes Exports of Copper	Aug.	33
Export Restrictions Are Needed for Ferrous (Ed)	Nov.	101
Iron and Steel, Restricts Exports of	Dec.	33
Specifications for Cupola Melting (Q & A)	Aug.	102
Screen		
Fluoroscopic Viewing, Develops (FD)	July	132
Gyrating, Announces	Dec.	207
Protects Pourer from Hot Metal	Sept.	268
Sealer, Announces Corebox	Oct.	241
Sealer, Offers Mold	May	432
Sears Roebuck & Co. Develops Bantam Tractor	Feb.	138
Sears Roebuck & Co. Introduces Tractor	Jan.	158
Selas Corp. of America Offers Soldering Furnace	Jan.	214
Separator		
Automatic Air Line Moisture, Offers	Jan.	226
Magnetic Grate, Designs	June	264
Oil and Moisture, Announces	Oct.	251
Self-Cleaning Moisture, Announces	Feb.	245
Service Caster & Truck Corp. Offers Lift Unit	Mar.	286
Service Station, Offers Mobile	Oct.	251
Severance Tool Industries Inc. Offers Hand File	June	265
Shakeout and Cleaning Equipment, Small	May	186
Shalco Engineering Corp. Develops Shell Core Machine	Oct.	253
Shalco Engineering Corp. Offers Shell Core Machine	July	220
Shallway Corp. Announces Shell Core Machine	July	220
Shallway Corp. Develops Shell Core Machine	Oct.	253
Shaw Processes Ltd. Develops Precision Castings	Sept.	242
Sheeting, Announces Protective	Feb.	232
Shell, Accuracy in Casting Artillery	July	96
Shell Bonding Fixture, Announces	Mar.	280
Shell Bonding Fixture, Offers Automatic	Oct.	245
Shell Core Machine, Announces	July	220
Shell Core Machine, Develops	Oct.	253
Shell Investment Unit, Announces	Dec.	206
Shell Mold Castings, Hardness in (Q & A)	Nov.	140
Shell Mold Foundry, G. E. Opens	Aug. 33; Sept.	266
Shell Mold Foundry, Walworth Co. Operates	Mar.	138
Shell Molding Machine		
And Coremaking Machine, Offers	Oct.	250
For Sand Resin Molds, Announces	May	414
Small Space-Saving, Offers	July	208
With Hydraulic Air System, Announces	Aug.	197
With Vertical Drop, Develops	May	402
Shell Molding Materials, Offers	Mar.	294
Shell Molding Process		
Backs up Molds with Steel Shot for (FD)	Jan.	176
Blowing Machine for	May	351
Design Considerations for (FD)	Nov.	230
Ejector Pins on Patterns in (FD)	June	160
Patterns and Backing for (Q & A)	Feb.	114
Resin-Impregnated Mahogany Veneer in (FD)	June	160
Sand Mixing for, Simplifies	Sept.	158
To Make Valve Tappets by (Q & A)	Jan.	114
Truck Engine Parts by, Casts	Aug.	126
Use of Resin in (FD)	Feb.	164
Shell Molds Leave Coating on Brass Fittings (Q & A)	Oct.	134
Shell Process Inc.		
Bonding Fixture, Announces	Mar.	280
Bonding Machine, Announces	Oct.	245
Changeover Dolly, Offers Pattern	Dec.	208
Shelter, Announces Loading	Feb.	238
Shepard Niles Crane & Hoist Corp. Offers Hoist	July	222
Sherman Electric Co. Offers Pyrometer Test Unit	Nov.	244
Shield, Offers Exposure	May	438
Shot		
And Grit, Announces	Jan.	234
Cut Wire, Develops	Jan.	224
For Deoxidizing Steel, Offers	July	209
Steel, Announces	Jan.	215
Shrink Holes in Iron and Steel Castings (Q & A)	Jan.	115
Shrinkage Defect, Loses Castings from (Q & A)	Jan.	114
Shrinkage in Propeller Hub (Q & A)	June	120
Shrinkage, Several Factors Influence Linear	Jan.	100
Sigma Engineering Co. Offers Ear Insert	Sept.	254
Signal, Announces Warning	Aug.	197
Silencer for Air Expelling Machines, Announces	Feb.	230
Silencer, Offers Exhaust	May	430

	Issue	Page
Simplicity Engineering Co. Develops Screen	Dec.	207
Skid, Offers Rail	May	424
Skil Corp. Announces Disc Sander	May	416
Skimmer, Swedish Foundry Develops Pouring (FD)	Jan.	176
Skimmer, Would Extend Life of Iron (Q & A)	Sept.	130
Slag Hole, Proper Time To Open Cupola (Q & A)	Feb.	114
Sleeve Bearings, Centrifugal Casting of	Dec.	102
Sleeve, Offers Spacer	May	412
Slings, To Check Safety of Rope	Jan.	137
Small Business Booklets	June 218; Aug. 162; Oct.	175
Smith Steel Casting Co. Makes Foundry Film	May	310
Smog, Issues Report on	Nov.	33
Smooth-On Mfg. Co. Offers Repair Compound	Sept.	259
Snap-Tite Inc. Offers Coupling	Dec.	208
Snow Plow Attachment, Designs	Nov.	236
Society of Automotive Engineers Issues Blast Cleaning Manual	Dec.	193
Softening Improves Gray Iron Machinability	Jan.	110
Soil Pipe and Fittings, Preparation of (Q & A)	Aug.	99
Solar Aircraft Co. Develops Device for Radiography	Jan.	202
Solidification, Fundamentals of Metal	Aug.	224
Solidification of Gray and Nodular Iron	June	108
Sonosorber Corp. Offers Sound Absorption Unit	May	416
Sound Absorption Unit, Offers	May	416
Southern California Chapter of the AFS		
Annual Picnic, Holds	Oct.	214
Officers, Elects	July	206
Old Timers' Meeting, Holds	Aug.	192
Shell Molding, Considers Equipment for	May	380
Southeastern Regional Conference, Holds AFS	Apr.	167
Southeastern Regional Conference, Plans AFS	Jan. 191; Feb.	33
Southern California Chapter of the AFS		
Christmas Party, Holds	Mar.	266
Cupola Operation and Mechanization, Studies	Apr.	212
Problem Castings, Considers	Jan.	188
Sand Fundamentals, Considers	Nov.	186
Zircon, Considers Use of	Dec.	186
Southern Foundry Marks 65 Years of Progress	Aug.	90
Southern Shell Mold Equipment Co. Offers Machine	May	402
Soybean Oil, Develops Drying Properties of (FD)	Mar.	158
Specifications (Standard) Data Sheet:		
Silicon-Bronze and Silicon-Brass Sand Castings	Nov.	203
Tin-Bronze and Leaded Tin Bronze Sand Castings	Dec.	199
Specification (Tentative) Data Sheet:		
Ferromanganese	Oct.	227
Gray Iron Castings, Automotive	Sept.	151
Magnesium-Base Alloy Sand Castings	Apr.	193
Nickel-Tin Bronze Castings	Aug.	149
Spectacles		
Opthalmic Frame for, Offers	Apr.	230
Shatterproof Safety, Offers	Apr.	248
Side Frame for, Announces	Aug.	204
With Plastic Lenses, Designs	Oct.	248
Spectrographic Analysis of Foundry Metal	Sept.	112
Spectrometer, Announces Direct Reading	Dec.	219
Spectrometer, Offers Double Optical System	Dec.	213
Spectrophotometric Procedures (FD)	Aug.	181
Speed Balance, Announces Semi-automatic	Mar.	293
Speed Drive, Announces Positive Variable	Feb.	236
Speed Drive, Offers Low	Feb.	230
Speed Reducer, Announces Herringbone	Aug.	207
Speed Reducer for Shaft Diameters, Offers	Mar.	292
Sperry Products Inc. Offers Inspection Film	Mar.	212
Sperry Products Inc. Develops Precision Instrument (FD)	Nov.	230
SPO Inc. Designs High-Speed Molding Machine	July	209
SPO Inc. Plans Company Addition	Sept.	175
Spotting Out Appears on Castings (Q & A)	Dec.	106
Springfield Foundry Co. Completes 100 Years	Sept.	33
Sprue Top, Compacting Sand at (Q & A)	July	107
Squeezer Machine, Designs Automatic Mold Counter for	Aug.	166
Stacker, Offers Pallet	Dec.	211
Staining of Aluminum Alloy Sheets in Salt Bath (FD)	Sept.	160
Stair Treads, Material for Abrasive-Coated (Q & A)	May	200
Standard Alloy Co. Designs Open-Link Belt	Oct.	247
Standard Electric Mfg. Co. Announces Blower	Feb.	247
Standard Electrical Tool Co.		
Grinder, Develops Carbide	May	428
Grinder, Offers Double End Snagging	Nov.	244
Grinder, Offers Single Wheel Wet	June	264
Standard for Carbon Steel Castings, Adopts Minimum	Oct.	132
Standard Horse Nail Co. Offers Chill	May	392
Standard Pattern Works Offers Core Grinder	May	392
Standard Pressed Steel Co. Installs Traffic Lights	Mar.	152
Standard Products Division Offers Hold-Back	Mar.	286
Stanford University Installs Accelerator	Feb.	34
Starrett, L. S., Co. Announces Micrometer	Nov.	242
Stearns Magnetic Inc.		
Brake, Develops Disk	July	215
Electromagnet, Builds Huge	Jan.	135
Magnet, Designs Spout	Sept.	252
Steel Castings, Adopts Standard for Carbon	Oct.	132
Steel Castings from Floor Pit, Raising (FD)	Sept.	160
Steel City Testing Machines Inc. Offers Hardness Tester	Jan.	219
Steel Founders' Society of America		
Annual Meeting Holds	May	224
Fall Meeting, Holds Annual	Nov.	156
Fall Meeting, Plans	Sept.	235
National Safety Council Award, Receives	Dec.	161
Standard for Carbon Steel Castings	Oct. 103 (Ed);	132
Technical and Operating Conference, Holds	Jan.	158
Winners in 1954 Safety Contest	Nov.	156
Steel Foundry Molding Sand	Nov.	122
Steel Inserts in Gray Iron, Casting-in (Q & A)	June	122
Steel Output at Peak, Stainless	May	366
Steel Shot, Backs up Shell Molds with (FD)	Jan.	176
Steel Shot Corp. Produces Shot and Grit	Jan.	234
Steel Structures Painting Council Issues Manual	Dec.	138
Steelmaking, Acid Electric	Oct.	120
Stephens-Adamson Mfg. Co.		
Ball Bearings, Announces Light	Apr.	249
Ball Bearings, Develops Lockproof	Jan.	216
Belt Conveyor Carrier, Offers	Sept.	254
Conveyor Belt Cleaner, Offers	Nov.	236
Sterling Electric Motors Inc. Offers Electric Motor	May	400
Stevens, Frederic B., Inc.		
Coating for Cores and Molds, Offers	Nov.	237
Core Paste, Announces	Apr.	231
President, Industrialists Honor	Feb.	173
Stokes, F. J., Machine Co. Designs Huge Furnace (FD)	Sept.	160
Stone Machinery Co. Offers Cutoff Machine	Jan.	220
Stoody Co. Announced Electrode	Feb.	246
Stop-Fire Inc. Announces Discharge Valve	Apr.	246
Stop-Fire Inc. Offers Fire Extinguisher	Mar.	282
Stoveplate Iron, Increase Heat Resistance of (Q & A)	July	110
Stress vs Strain in Hot Tearing	Aug.	76
String Reinforces Cores, Resin-Impregnated (FD)	Aug.	181
Studebaker-Packard Corp. Installs Moisture Controls	Nov.	169
Sugar Beet Products Co. Offers Dispenser	Feb.	245
Sulphurization of Steel or Cast Iron, Studies (FD)	Oct.	176
Sun Chemical Corp. Offers Floor Compound	Nov.	247
Surface Plates Show Open-Grain Finish (Q & A)	Apr.	132
Surface Rolling Affects Fatigue Strength (FD)	Jan.	176
Surfacing for Pulley Lagging, Offers Non-Slip	Sept.	245
Sutter Products Co.		
Core Blower, Announces Automatic Dual-Head	Apr.	231
Core Blower, Offers Two-Station	Oct.	240
Mold Machine for Lightweight Castings, Offers	May	422
Swan-Finch Oil Corp. Offers Anniversary Booklet	Feb.	256
Swartwout Co. Offers Fan Ventilator	Apr.	250
Sweeper		
Magnetic Floor, Announces	Nov.	255
Magnetic Road, Offers	Feb.	232
Motorized Power, Develops	Jan.	229
Power, Announces	May	426
Powered Floor, Develops	June	278
Swiss Foundry Incorporates Automatic Controls	Jan.	104
Swiss Foundry Issues Wheel Story (German)	May	336
Swiss Twin Molding Machine, Designs	May	257
Switch		
Electric Safety, Announces	Nov.	250
Heavy-Duty Limit, Offers	Aug.	197
Precision Limit, Announces	Oct.	242
Swivel Fasteners, Inserts Cause Blows in (Q & A)	Nov.	140
Symposium, Molding Sand	Nov.	102-139
Synthetic Molding Sand, Fundamentals of	Nov.	108
Syntron Co.		
Equipment, Offers Vibrating	Feb.	244
Feeder, Announces Vibratory	Nov.	244
Polishing Machine, Announces	Oct.	255

T

Table, Announces Positioning	Feb.	240
Tabor Mfg. Co. Offers Jar-Squeeze Machine	May	434
Tank Parts, Casting	Mar.	144
Tappets, Shell Molding Process for Valve (Q & A)	Jan.	114
Taylor, S. G., Chain Co. Offers Sling Hook	July	220
Technical Operations Inc. Offers Shield	May	438
Techno Products Inc. Announces Pressure C-Clamp	May	400
Telephone Booth, Announces Doorless	July	222
Tellurium Stabilizes Carbide (Q & A)	Jan.	116
Tempil Corp. Offers Temperature Indicator	Dec.	219
Template, Announces Profile	Apr.	230
Tennant, C., Sons & Co. Announces Hardness Tester	Feb.	225
Tennessee Chapter of the AFS		
Blast Equipment, Considers	Mar.	266
Core Room Mechanization, Considers	May	371
High Pressure Molding, Studies	Dec.	188
Human Engineering, Considers	Jan.	190
Southeastern Regional Conference, Holds	Apr.	167
Southeastern Regional Conference, Plans	Jan.	191
Tensile Strength of Cast Iron (Q & A)	May	199
Test Bars for Base Alloy Castings	June 96; July	100
Tester		
Atmosphere, Offers	May	424
Portable Bench Type, Announces	July	222
Reflex Hardness, Designs	Sept.	257
Rockwell Hardness, Announces	July	215
Rockwell Hardness, Offers	Sept.	252
Volt-Ampere, Develops	May	406
Testing Aircraft Castings	Mar.	110
Testing Machine, Offers Brinell	Feb.	243
Testing Machine, Announces Polaroid	Apr.	240
Texas Chapter of the AFS		
Clean Safe Foundries, Considers	May	380
Light Metal Foundry Practice, Studies	Apr.	208
Lone Star Steel Co., Visits	Feb.	206
San Antonio Section Considers Silicones	July	195
San Antonio Section Elects Officers	Nov.	192
San Antonio Section Views Ford Foundry Film	Mar.	264
San Antonio Section Views GMC Foundry Film	May	382
San Antonio Section Views Safety Film	June	246
San Antonio Section Views Shell Molding Film	Jan.	178
San Antonio Section Visits Alamo Iron Works	Sept.	232
Welding Film, Views	Dec.	184
Texas Foundries Inc. Marks 15th Anniversary	June	186
Therm-O-Wheel Inc. Offers Heat Recovery Unit	Feb.	233
Thermenol as Substitute for Stainless Steel, Uses (FD)	July	132
Thermocouple Measures Temperatures, Thread-like (FD)	May	236
Thermel Inc. Offers Nozzle Heater	Mar.	280
Thermo Electric Mfg. Co. Offers Hot Plate	Apr.	242
Thermocouple Well, Develops	Mar.	280
Thickening Castings without Changing Patterns	May	333
Thiokol Chemical Corp. Offers Liquid Polymer (FD)	Nov.	230
Third Man in the Ring	Jan.	132
Thread Restoring Tool, Announces	Jan.	222
Thulium Is Made Applicable to Radiography (FD)	July	132
Tilting Device for Tumbling Barrel, Offers Power	Sept.	246
Time Savers in the Nonferrous Foundry	Apr.	202
Timer, Announces Mulling Cycle	Oct.	254
Timken Roller Bearing Co. Makes Vibration Detector	May	268
Tin Sweat Forms Skin on Bronze Castings (Q & A)	July	108
Tire, Announces Tubeless	Sept.	246
Titanium		
Casting	Feb.	94
Furnace for Melting of, Designs (FD)	June	160
Molds for Casting of, Studies Expendable (FD)	July	132
Report on, Offers Research	Dec.	237
Titanium Casting Corp. Uses New Process	Nov.	33
Titanium Metals Corp. of America Designs Remelting Furnace	Sept.	210
Titeflex Inc. Announces Coupling	Nov.	258
Toledo Porcelain Enamel Products Co. Offers Roofing	Feb.	224
Tool Dressing, Offers Unit for	May	426
Toolcraft Mfg. Co. Offers Profile Template	Apr.	230
Torit Mfg. Co. Announces Dust Collector	May	393
Torit Mfg. Co. Offers Dust Bin	Mar.	291

	Issue	Page
Torque Drive, Develops	July	209
Torsion Balance Co. Announces Hardness Tester	Sept.	252
Tour, Sam, & Co. Offers Alloy Analysis Service	July	245
Towmotor Corp.		
Foreign Outlet, Establishes	Feb.	222
Fork Lift Truck, Develops	Jan.	224
Fuel Additive, Announces	June	269
Materials Handling Pallet Sheets, Offers	May	408
New Plant Streamlines Production Facilities	Dec.	152
Power Steering for Fork Lift Trucks, Offers	Mar.	292
Tracer, Announces Hydraulic	Mar.	287
Tractomotive Corp. Announces Loader	Nov.	243
Tractor		
Three-Wheel, Introduces	Jan.	158
Towing, Offers General Utility	June	277
Towing, Redesigns	Mar.	287
Tractor Shovel for Bulk Materials, Offers	Jan.	224
Tractor Shovel, Offers Hydraulic	May	392
Trade Names, Directory of	Mar.	165
Trade Publications: Jan. 254; Feb. 265; Mar. 315; Apr. 273; May June 301; July 252; Aug. 239; Sept. 281; Oct. 269; Nov. Dec. 252		454; 273;
Trailer Attachment Lengthens Platform Truck (FD)	Mar.	158
Trammel, Offers Steel Beam	Jan.	230
Transport System Considers Casting Repair Change (Q & A)	Aug.	100
Trolley, Announces Heavy Duty	Dec.	215
Trouble Shooting:	Aug. 176; Sept. 202; Oct. 166; Dec.	144
Truck		
End Dump, Develops	Sept.	260
Fire, Announces Industrial	Oct.	252
Fire Fighting, Announces	Sept.	258
Foot or Pump-Operated Lift, Offers	Apr.	240
For Light and Heavy Loads, Offers Pallet	June	272
Gas-Powered Lift, Offers	Dec.	218
Gasoline Engine Fork, Announces	Apr.	240
Gasoline-Powered Fork Lift, Offers	Nov.	255
LPG Fork Lift, Announces	Nov.	238
Large-type Fork Lift, Redesigns	Jan.	224
Low Lift Platform, Announces	Nov.	236
Magnesium Hand, Announces	Aug.	196
True Gun-All Equipment Co. Offers Refractories Gun	Oct.	240
True-Trace Sales Corp. Offers Tracer	Mar.	287
Tube Reducing Corp. Gets Giant Bearing	May	268
Tubing, Molten Metal Cuts Steel (Q & A)	Oct.	134
Tumbling, Cleaning Castings by	Oct.	236
Tumbling of Brass Castings (Q & A)	Dec.	108
Turbojets, Ford Pushes Production of	Jan.	151
Turkish Foundryman—Old and New	Feb.	153
Turner & Haws Engineering Co. Offers Dust Collector	July	209
Turtle Club Memberships, Awards	Jan.	134
Tweco Products Co. Announces Electrode Holder	Apr.	240
Twin City Chapter of the AFS		
Apprentice Contest Prizes, Announces	July	198
Modern Cupola Operation, Studies	May	378
Officers, Elects	June	244
Panel Discussion, Holds	Dec.	182
Pattern Trends, Considers	Apr.	220
Safety and Hygiene Institute, Holds	Feb.	209
Student-Apprentice Activities, Sponsors	Nov.	189
Students and Faculty Members, Entertains	Jan.	186
Type Holder, Announces	Sept.	254

U

U. S. Gypsum Co. Develops New Casting Plaster	Nov.	252
U. S. Navy, Floating Foundries in the	Aug.	88
U. S. Reduction Co. Marks 50th Anniversary	July	226
U. S. Steel Corp. Modernizes Ingot Mold Foundry	June	188
U. S. Steel Corp. Studies Hydrogen Content (FD)	June	160
Ultra-Violet Products Inc. Offers Blacklight Lamp	Jan.	226
Union Carbide & Carbon Corp. Receives Safety Award	Oct.	230
Union Metal Mfg. Co.		
Box, Announces Hopper Dump	Nov.	237
Box, Develops Drop-Bottom	Oct.	240
Cuts Costs with Moderate Investment	Apr.	172
Work Hopper, Offers	Feb.	229
Unitcast Corp., Human Relations at	July	90
United Engineering & Foundry Co. Builds Huge Press	July	180
United Laboratories Inc. Offers Heavy Duty Flooring	Feb.	240
United Specialty Corp. Offers Welding Hose Reel	July	223
United States Diamond Wheel Co. Offers Dressing Tool	Feb.	229
United States Rubber Co. Offers Belting	Apr.	242
United States Rubber Co. Offers Breaker Strip	May	446
United States Safety Service Co. Offers Lenses	Mar.	287
United States Safety Service Co. Offers Spectacles	Oct.	248
United Steel Fabricators Inc. Offer Building Units	May	436
University of Alabama Student Chapter Plans Regional Conference	Jan.	191
University of Illinois Receives Foundry Equipment	June	155
University of Iowa Plans Management Course	Apr.	181
University of Michigan Plans Cast Metal Courses	May	356
University of Wisconsin Holds Regional Conference	Apr.	153
University of Wisconsin Receives Shakeout	Aug.	226
Utica Drop Forge & Tool Corp. Installs Vacuum Furnace (FD)	Sept.	160

V

V-Belt, Announces Heat Resistant	Mar.	281
V-Belt, Offers Equal Load Distribution	Sept.	244
Vacu-Blast Co. Offers Pneumatic Conveyor	Jan.	229
Vacuum Casting Methods, Cites (Q & A)	July	108
Vacuum Cleaner, Designs Portable	Sept.	250
Vacuum Cleaner, Offers Industrial	Feb.	226
Vacuum Degassing of Nonferrous Metals	Dec.	78
Vacuum Die Casting Process, Develops (FD)	May	236
Vacuum Machine for Dry Clean-up Work, Offers	Mar.	289
Valve		
Air Control, Designs	June	270
Air Control, Offers	Oct.	248
For Air and Gas Compressor, Offers	Mar.	280
For Air or Hydraulic Service, Offers	Feb.	238
For Dry Chemical Fire Extinguisher, Offers	Apr.	246
Four-Way, Announces	Nov.	248
Four-way Poppet Type, Offers	Jan.	230
Hydraulic, Announces	May	408
Pilot Action Solenoid, Offers	Aug.	202
Piston-Type Oil Relief, Offers	Mar.	290
Remote Control Deadman, Announces	Mar.	287
Rubber Covered Hose, Announces	Dec.	213
Sealed Cover Air, Offers	May	420
Shrinkage Occurs in Steam Jacket (Q & A)	Nov.	141
Solenoid Operated Air Control, Offers	July	224
Valve Castings, Strainer Core for Globe (Q & A)	Feb.	118
Valve Coupling, Announces	May	393
Vanadium Corp. of America Offers Ferrochromium Alloy	Jan.	231
Vanadium Corp. of America Opens Research Center	Mar.	142
Ventilation for Swing Frame Grinders, Develops (FD)	Oct.	176
Ventilation Unit, Develops	Sept.	254
Ventilator, Announces Fan	Apr.	250
Vibrating Equipment, Announces	Feb.	244
Vibrator		
Compact Portable, Develops	Jan.	220
Heavy Duty, Designs	Mar.	290
Lightweight and Heavy Duty, Announces	Oct.	246
Noiseless Pneumatic, Offers	Oct.	245
Viewer, Announces X-ray Film	Nov.	256
Vise		
Air-Powered Hydraulic, Designs	Oct.	246
All-Purpose, Announces	Feb.	246
For Holding Castings during Cleaning, Uses	Sept.	276
Power-Operated, Offers	Feb.	243
Quick Action Clamp, Offers	May	424
Von Jonker Corp. Offers Belt Sander	May	410

W

Walker-Turner Division Offers Band Saw	Feb.	242
Wall Colmonoy Corp. Announces Hardfacing Electrode	July	210
Wall Colmonoy Corp. Offers Welding Rod	Feb.	234
Wallace, J. D., & Co. Offers Positioning Table	Feb.	240
Walworth Co. Operates Shell Mold Foundry	Mar.	138
Warpage Causes Trouble in Gray Iron Castings (Q & A)	Dec.	108
Warpage in Long Aluminum Castings (Q & A)	June	121
Washington Chapter of the AFS		
Foundry Mechanization, Considers	Jan.	178
Ladies' Night, Holds	Aug.	186
Officers, Elects	June	240
Sand Fundamentals, Studies	Nov.	184
Waste Elimination Program, Foundries Need (Ed)	Feb.	85
Waste, Weed out Foundry (Ed)	Apr.	101
Watchemoket Optical Co.		
Goggle, Announces Welding	May	438
Side Shields for Spectacles, Offers	Aug.	204
Spectacles, Offers Safety	Apr.	248
Water Glass as Binder, German Process Uses (FD)	July	132
Waterbury Farrel Foundry & Machine, Cupola Charging	Oct.	116
Wax, Announces Sheet	Apr.	230
Welder, Announces Rectifier Type	Apr.	244
Welder, Offers Portable Arc	Sept.	252
Welding		
Aluminum Alloys for, Offers	Feb.	238
Foundry Repair	Jan.	204
Of Cast Iron, Describes Gas	July	34
Of Copper and Copper Alloy Castings	Sept.	165
Of Huge Steel Castings, Thermit (FD)	Feb.	164
Welding Accessories, Announces	June	266
Welding Control Tubes, Announces	Feb.	224
Welding Rod, Announces Manganese-Nickel Steel	Feb.	234
Welding Rod, Offers Low Melting Point	Jan.	215
Weldit Inc. Offers Portable Salamander	Sept.	260
Welworthy Ltd. Bonds Bimetallic Components	Sept.	102
West Bend Equipment Corp. Offers Belt Conveyor	July	208
West Disinfecting Co. Offers Hand Cleaner	Apr.	232
Westberg Developments Ltd., Sampling Device (FD)	Jan.	176
Western Metal Congress, Plans	Dec.	240
Western Michigan Chapter of the AFS		
Annual Outing, Holds	Nov.	184
Nodular Iron, Considers	Dec.	181
Officers, Elects	Aug.	184
Western New York Chapter of the AFS		
Compensation Laws, Considers	Jan.	178
Foundry Industry Development, Considers	Feb.	206
Green Sand, Considers Molding with	May	376
Grinding Wheels, Considers	Apr.	220
Pressure Molding, Considers	July	204
Westinghouse Electric Corp. Announces Motor	May	412
Westinghouse Electric Corp. Offers Gas Heater	Jan.	214
Wetting Agent, Announces	Oct.	254
Wheel		
Abrasive Band, Announces	Dec.	214
All-Purpose Abrasive, Offers	July	210
For Nonferrous Metals, Offers Cutting	Dec.	212
For Rough Grinding, Designs	Aug.	206
Hard Resin Grinding, Announces	Nov.	238
Resin-Bond Grinding, Announces	Feb.	244
Wheel Dresser, Announces Grinding	May	410
Wheel Dresser, Offers Self-Lubricating	Aug.	201
Wheel Rack for Shipping, Announces	Jan.	220
Wheelbarrow, Announces Power	Jan.	226
Wheelbarrow Safety Attachment, Offers	Sept.	262
Wheelco Instruments Division Offers Potentiometer	Sept.	249
Wheeler Protective Apparel Offers Asbestos Clothing	Nov.	248
Wheels, Development of (German)	May	336
Wheels, Develops Technique for Casting Car (FD)	Dec.	156
Where-To-Buy Directory	Mar.	192
White Iron, Cold Cracks in	Apr.	122
White Iron Production Method (Q & A)	June	120
White, R. G., Engineering Co. Offers Lubricator	Oct.	251
Whiting Corp.		
Arc Furnace Control, Announces	June	265
Crane Control, Develops	Sept.	256
Cupola Melting, Issues Folder on	Feb.	192
Heat Exchanger, Announces	Oct.	241
Hydro-Arc Furnace Control, Develops	Oct.	256
New York Industrialists, Entertains	Jan.	135
Old Foundry, Closes	Sept.	175
Who's Excited?	Apr.	178
Why Take Chances? (Ed)	Dec.	77
Wilkerson Corp.		
Automatic Float Unit, Offers	Dec.	214
Drain, Announces Automatic	May	399
Separator, Announces Moisture	Jan.	226
Williams, E. A. & Son Nonferrous Foundry Moves Plant	June	202

	Issue	Page
Willson Products Inc. Designs Safety Goggles	Sept.	252
Wilputte Coke Oven Division Increases Capacity	Feb.	202
Wilshire Power Sweeper Co. Offers Improved Unit	May	426
Wilton Tool Mfg. Co. Develops Air-Powered Vise	Oct.	246
Wilton Tool Mfg. Co. Offers Power Vise	Feb.	243
Winslow Co. Announces Input Controller	Nov.	254
Winter Engineering Co. Develops Shell Mold Equipment	Jan.	214
Wireless Intercom Plugs, Offers	July	216
Wisconsin Chapter of the AFS		
Annual Outing, Holds	Sept.	232
Castings, Studies Buying of	May	382
Christmas Party, Holds	Feb.	218
Management Night, Holds	Apr.	220
Officers, Elects	June	248
Old Timers' and Apprentices' Meeting, Holds	Aug.	189
Pressure Molding, Studies	Dec.	181
Regional Foundry Conference, Holds	Apr.	153
Regional Foundry Conference, Plans	Jan.	171
Sectional Meetings, Holds	Jan.	180
Technical Sessions, Holds	Nov.	182
Wisconsin Fair Sponsors Model Foundry	Dec.	174
Wisconsin Foundries Sponsor Booth at State Fair	Nov.	172
With the Editors:	Jan.-Dec.	10
Wolverine Shoe & Tanning Corp. Offers Safety Gloves	Jan.	214
Woodworking Machine, Announces	Apr.	248
Wrench, Announces Pipe	Jan.	231
Wright-Austin Co. Offers Moisture Separator	Feb.	245
Wyss, Escher, Ltd., Modern Swiss Foundry of	Jan.	104

X

X-ray		
Diffraction Course for, Plans	May	254
Radiographic Characteristics of High Energy	Feb.	108
Self-Contained Sources of, Develops (FD)	Mar.	158

Y

Yale & Towne Mfg. Co. Builds Huge Straddle Truck	Dec.	150
Yard Work Equipment, Small	May	179

Z

Zinc in Rubber Latex Paint Protects Metals (FD)	May	236
Zinc, Process for Recovery of (FD)	Dec.	156
Zinc-Base Alloy Shipments: Jan. 144; Feb. 148; Mar. 156; Apr. 160; May 250; June 166; July 158; Aug. 132; Sept. 238; Oct. 234; Nov. 178; Dec. 196		
Zonolite Co. Offers Firebrick	Mar.	292
Zylo Ware Corp. Offers Protective Glasses	Apr.	230

Author Index—1954

	Issue	Page
A		
Ackerlind, C. G; Pellini, William S.; and Dunphy, R. P. Solidification and Feeding of Gray and Nodular Iron	June	108
Adams, W. R. and Barlow, Tom High-Pressure Molding	Apr.	111
Ammen, C. W. Trouble Shooting:	Aug. 176; Sept. 202; Oct. 166; Dec.	144
Arndt, H. F. and Songer, R. J. Electrode Control Cuts Furnace Costs	May	325
Austin, C. R. Hot Forging and Rolling of Iron Castings	July	86
B		
Baer, William H. and Bolt, Jack E. Floating Foundries	Aug.	88
Baker, L. H. Quick Mold Repair and Safe Pattern Rapping	Dec.	154
Barlow, Tom and Adams, W. R. High-Pressure Molding	Apr.	111
Bartosz, Leonard One Individual's Help in a Safety Program	Feb.	107
Bell, R. J. Elevator Belts, Device Protects	Apr.	201
Bishop, Harold F.; Pellini, William S.; and Johnson, W. H. Gating Factors	Apr.	102
Bishop, Harold F.; Pellini, William S.; and Layne, Edward E. Vacuum Degassing of Nonferrous Metals	Dec.	78
Bishop, Harold F.; Pellini, William S.; and Sandoz, G. A. Notch Ductility of Nodular Irons	Sept.	114
Bishop, Warner B. Common Sense in Cores	July	84
Blakley, Tom Cartoons:	Jan.	260
Bloodworth, Alvin H. Cartoons:	Sept. 206; Nov. 266; Dec.	242
Bolt, Jack E. and Baer, William H. Floating Foundries	Aug.	88
Bremer, Edwin ASTM Annual Meeting, Holds	Aug.	128
East Coast Regional Conference, Holds AFS	May	304
Electric Furnace Operators Meet	Jan.	128
Malleable Foundry Modernizes Facilities	Sept.	108
Michigan Regional Foundry Conference, Holds	Dec.	129
National Metal Congress, Holds	Dec.	240
Rapid Cupola Charging	Oct.	116
Wisconsin Regional Conference, Holds	Apr.	153
Brewster, Frank S. Sand Control for the Average Foundry, Practical	Nov.	102
Briggs, C. W. Metallurgical Engineer, The	Jan.	98
Burgess, Charles O. Annealing Improves Gray Iron Machinability	Jan.	110
Flame Hardening of Gray Iron Castings	Apr.	114
C		
Caine, John B. Hot Tearing, Stress vs Strain in	Aug.	76
Steel Foundry Molding Sand	Nov.	122
Carrington, E. Quoting on Aluminum Castings	May	313
Chamberland, H. J. Band Filing Helps Reduce Foundry Costs	Mar.	108
Chandley, George D. MIT Holds Light Metals Conference	Oct.	178
Chapple, Hubert Linear Shrinkage, Several Factors Influence	Jan.	100
Wet Sand Reclamation	Oct.	112
Colton, Robert A. and Lavelle, Donald L. Test Bars for Copper and Aluminum Base Alloy Castings	June 96; July	100
Conger, G. A. and Hexamer, L. E. Blowing Machine Makes Molds and Cores	May	351
D		
Darin, Bruno F. Controlling Leakers in Gray Iron Castings	Mar.	214
de Laval, Carl G. Melting Iron in the Reverberatory Furnace	Mar.	224
Delport, Vincent Berliet Foundries Employ Modern Methods	Dec.	90
Bimetallic Castings, Bonding Process for	Sept.	102
Institute of British Foundrymen Annual Meeting	Aug.	135
Institute of British Foundrymen's 50th Anniversary	June	180
International Foundry Congress, Holds 1954	Dec.	170
Technical Papers of IBF Conference	Sept.	182
Dickinson, Thomas A. Close Control in Die Casting Magnesium	May	339
Testing Aircraft Castings	Mar.	110
Dilts, Joe Cartoons:	July 148, 150; Sept. 191; Nov.	271
Dodge, A. O. Welding Copper and Copper Alloy Castings	Sept.	165
Dougherty, William E. Automation in the Foundry	May	140
Dufty, N. F. Acid Electric Steelmaking, Chemistry of	Oct.	120
Dunbeck, Norman J. Fundamentals of Synthetic Molding Sand	Nov.	108
Dunphy, R. P.; Ackerlind, C. G.; and Pellini, William S. Solidification and Feeding of Gray and Nodular Iron	June	108
Dwyer, Pat Adventures of Bill	Jan. 196; Feb.	200
Core Blowing Equipment and Use (ABC) (II)	Jan. 168; Feb. 220; Mar.	237
E		
Ebeling, F. A. Cleaning Castings by Tumbling	Oct.	236
Elsaman, Glenn S. Grinding Operations in the Cleaning Room	May 384; June	220
Emery, L. E. Molding Sand Practice in the Malleable Foundy	Nov.	126
F		
Fair, Ernest W. Buying Foundry Equipment, Things To Watch in	Dec.	228
Foor, E. R. Universal Jig Holds Parts for Radiography	Jan.	202
Forbes, Dewar Band Saw Cuts Teeth on Gear Pattern	Nov.	160
Forsberg, H. A. Safety Works If You Work at It!	Aug.	80
Fry, Eugene Foremen—Working or Thinking	Sept.	216
Frey, Dr. Victor Modern Swiss Foundry Uses Automatic Controls	Jan.	104
G		
Geitman, R. J. Foundry Mechanization, Developments in	Aug.	70
George, William B. Molding Sand in the Brass Foundry	Nov.	130
Glueckstein, Robert W. Cartoons:	Sept. 242; Nov.	263
Goldberg, C. Time Savers in the Nonferrous Foundry	Apr.	202
Grott, Gerald J. and Zang, Victor E. pH Value of Molding Sands	June	116
Gude, William G. Investment Casting Institute Holds Annual Meeting	Dec.	140
Modern Design at Fairbanks Morse Foundry	Oct.	104
Nonferrous Founders' Society Holds Annual Meeting	June	190
Purdue Metals Castings Conference, Holds	Dec.	238
Report on the Foundry Industry	July	183
Southeastern Foundrymen Meet	Apr.	167
Southern Foundry Marks 65 Years of Progress	Aug.	90
Guglielmino, Joseph One Individual's Help in a Safety Program	Mar.	258
H		
Hall, John Howe Cast-Weld Construction	Mar.	114
Halliday, W. M. Casting Defects—Their Causes and Remedies	Feb.	113
Eliminating Defects in Die Castings	Dec.	84
Ham, John and Veneklasen, Roger Casting Titanium	Feb.	94

	Issue	Page
Hardy, Thomas H.		
Natural Sands of Mid-America	Nov.	114
Harper, Leslie E.		
Spectrographic Analysis of Foundry Metal	Sept.	112
Harris, D. W.		
Second Cupola Spout Delivers Hot Metal	Aug.	166
Hawver, Wilbert		
Cartoons:	July 165; Sept.	270
Henderson, Harold E.		
Turkish Foundryman—Old and New	Feb.	153
Herrmann, Robert H.		
Canadian AFS Chapters Hold Foundry Conference	Dec.	202
Casting 280 MM Artillery Shell	July	96
Closed-Top Cupolas End Air Contamination	Dec.	86
Continuous Mixer Tempers Sand Automatically	Nov.	169
Conveyor Belting, Installation and Maintenance of	Feb.	86
Enameled Gray Iron Cookware Expands Market	Sept.	186
Ends Cleaning Room Bottleneck	Dec.	94
Ganging Up on Small Cores Increases Production	June	215
Jig Holds Castings in Grinding Machine Operation	Jan.	156
Magnesium Sand Foundry Produces Varied Castings	Mar.	102
National Founders Hold Annual Meeting	Dec.	123
Permanent Magnet Foundry, Electric Operation Features	Jan.	86
Pickling Castings at Lebanon Steel Foundry	Dec.	135
Progressive Policies Feature Steel Foundry	Apr.	108
Small Foundry Is Rebuilt into Mechanized Operation	July	78
Hexamer, L. E. and Conger, G. A.		
Blowing Machine Makes Molds and Cores	May	351
Hirsch, Phil		
Fitting the Foundry Worker to his Job	Sept.	124
Hodgson, G. F.		
Magnesium Die Casting	Feb.	102
Hopkins, Curtis		
Cartoons:	Jan. 257; July 154; Sept.	169
Hopp, K. J.		
Magnesium Molding Sand	Nov.	138
Hyler, John E.		
Holding Castings for Cleaning	Sept.	276
Repairing Faulty Castings	Nov.	209

J

Johnson, Albert S.		
Cutting Refractory Costs in Malleable Iron Production	June	106
Johnson, Delmar		
Mechanizing a Small Foundry	Aug.	212
Johnson, W. H.; Bishop, Harold F.; and Pellini, William S.		
Gating Factors	Apr.	102
Jory, Edwin J.		
Cold Cracks in White Iron	Apr.	122
Foundryman Considers Quality, The	Feb.	112
Small Foundry Can Use Modern Methods	Oct.	115

K

Kaelin, Lawrence		
Human Side of Accident Statistics, The	Feb.	106
Kelley, Gilbert A.		
Crane's Malleable Foundry Yields Economy	Feb.	170
Ketter, Oscar P.		
Casting Buying vs Buying Castings	June	102
Klayer, Walter J.		
Aluminum Foundry Molding Sand Use	Nov.	134
Knight, Lester B.		
Modernize Your Foundry, How To	May	132

L

Lavelle, Donald L. and Colton, Robert A.		
Test Bars for Copper and Aluminum Base Alloy Castings	June 96; July	100
Layne, Edward E.; Bishop, Harold F.; and Pellini, William S.		
Vacuum Degassing of Nonferrous Metals	Dec.	78
Lee, Ralph L.		
Man-to-Man: Jan. 146; Feb. 180; Mar. 150; Apr. 156; May 262; June 198; July 177; Aug. 146; Sept. 178; Oct. 164; Nov. 164; Dec. 166		
Lipson, S.; Saia, A.; and Rosenthal, H.		
Induction Melted Aluminum Alloys, Effect of Melting Frequency on	Aug.	84
Love, Robert M.		
Roll Maker Modernizes Foundries	Mar.	246
U. S. Steel Modernizes Ingot Mold Foundry	June	188

Mc

McCulloch, F. J.		
Asbestos-Wrapped Bar Solves Coring Problem	Feb.	167
Thickening Castings without Changing Patterns	May	333
McIntyre, J. B.		
British Foundry Education	July	92

M

Marshall, K. G.		
Core Blowing in a Steel Foundry	Mar.	304
Miller, George E.		
Molding Machine and Core Blower Maintenance	Feb.	100
Miller, Neil		
How a Safety Program Can Operate	Mar.	256
Miller, R. W.		
Lead in Cupola Scrap Does not Harm Castings	May	316
Miske, Jack C.		
Management Can Improve Human Relations, How	July	90
Productive Maintenance, A Plan for	Sept.	122
Miske, Jack C. and Mountain, Kenneth L.		
New England Regional Foundry Conference, Holds	Dec.	158
Mohler, J. B.		
Centrifugal Casting of Sleeve Bearings	Dec.	102
Mountain, Kenneth L.		
To Keep Resin Bonded Core Sections Together	Nov.	160
Mountain, Kenneth L. and Miske, Jack C.		
New England Regional Foundry Conference, Holds	Dec.	158
Mountain, Kenneth L. and Steinebach, Frank G.		
FEF Holds College-Industry Conference	May	276

O

Olander, H. Ward		
Air Moves the Sand at Allis-Chalmers	Feb.	96
Olmsted, Richard H.		
Naturally Bonded Molding Sand	Nov.	112
Ousley, W. K.		
What Makes a Plant Safe?	Mar.	120

P

Pace, A. L.		
Radiographic Characteristics of High-Energy X-rays	Feb.	108
Parker, W. G.		
Molding Sand Use in the Gray Iron Foundry	Nov.	116
Patterson, J. A.		
Gangway: Jan. 148; Feb. 222; Mar. 238; Apr. 175; Sept. 216; Nov. 142; Dec. 110		
Pellini, William S.		
Foundry Research in England	Mar.	112
Pellini, William S.; Bishop, Harold F.; and Johnson, W. H.		
Gating Factors	Apr.	102
Pellini, William S.; Bishop, Harold F.; and Layne, Edward E.		
Vacuum Degassing of Nonferrous Metals	Dec.	78
Pellini, William S.; Bishop, Harold F.; and Sandoz, G. A.		
Notch Ductility of Nodular Irons	Sept.	114
Pellini, William S.; Dunphy, R. P.; and Ackerlind, C. G.		
Solidification and Feeding of Gray and Nodular Iron	June	108
Pope, George		
Who's Excited?	Apr.	178
Pratt, Wilson N.		
Casting Impregnation, Improvements in	Feb.	248
Price, Ben K.		
Third Man in the Ring	Jan.	132
Pridmore, L. D.		
Ganging Up on Small Cores Increases Production	June	215
Putnam, Robert J.		
Automatic Mold Counter for Squeezer Machine	Aug.	166

R

Reed, Lewis B.		
Sand Castings Can Be Made to Close Tolerances	Jan.	92
Richards, Walter C.		
How To Make Sure Your Slings Are Safe	Jan.	137
Roast, Harold J.		
Solving Problems in the Brass Foundry	Sept. 106; Oct.	130
Rosenthal, H.; Lipson, S.; and Saia, A.		
Induction Melted Aluminum Alloys, Effect of Melting Frequency on	Aug.	84
Ross, Erle		
How To Mothball a Steel Foundry	Oct.	194
Production of Turbojets, Ford Prepares To Push	Jan.	151
Scholarship Fund of Chicago AFS Chapter	Mar.	252
Ross, Fuller		
Floor Cleaning Can Be Done Efficiently	Nov.	174

S

Saia, A.; Lipson, S.; and Rosenthal, H.		
Induction Melted Aluminum Alloys, Effect of Melting Frequency on	Aug.	84
Sandoz, G. A. Bishop, H. F.; and Pellini, W. S.		
Notch Ductility of Nodular Irons	Sept.	114
Scholtz, W. F.		
Noise, Combatting Effects of	Apr.	112
Schubert, Carl E.		
Phenolic Resin Core Binders, Properties of	Dec.	100
Scott, Ormie R.		
Compressed Air Removed Core Stick	July	189
Sobers, William B.		
How a Safety Program Can Operate	Feb.	190
Songer, R. J. and Arndt, H. F.		
Electrode Control Cuts Furnace Costs	May	325
Steinebach, Frank G.		
FEMA Holds 36th Annual Meeting	Dec.	126
Malleable Founders' Society Holds Annual Meeting	Aug.	152
Malleable Founders' Society Holds Marketing Conference	June	173
Steel Founders' Society Holds Annual Meeting	May	224
Steel Founders' Society Holds Fall Meeting	Nov.	156
Steinebach, Frank G. and Mountain, Kenneth L.		
FEF Holds College-Industry Conference	May	276

T

Tharp, William G.		
Cartoons: Jan. 130; Feb. 184, 190, 195; Mar. 147; Apr. 188, 191, 196, 278; June 176; Oct. 238; Dec. 249		
Trevithick, T. H.		
Fundamentals of Metals Solidification	Aug.	224
Principles of Refractories (ABC)	Apr.	226

V

Van Atta, Dr. Floyd		
Dermatitis Prevention in Foundry Industry	May	289
Veneklasen, Roger and Ham, John		
Casting Titanium	Feb.	94

W

Warga, Frank		
Close-Tolerance Castings, Foundry Makes	Apr.	124
Waterman, E. R.		
Repair Casting without Use of Pattern, Makes	Oct.	204
Weigand, James		
How a Safety Program Can Operate	Feb.	190
Welty, Lester		
Quality Control in a Gray Iron Foundry	Oct.	126
Westbrook, Francis A.		
Mechanical Handling Raises Efficiency	May	362
Wickland, A. A.		
Molding Sand Preparation—Past and Present	May	242
Williams, W. S.		
Industrial Engineer, The	Jan.	98
Williamsen, C. T.		
Foundry Repair Welding	Jan.	204
Wolfer, Harold		
Northwest Regional Conference, Holds	Jan.	162
Wood, R. L.		
Design and Control for Investment Castings	Sept.	120

Y

Yearley, B. C.		
Mechanical Engineer, The	Jan.	98

Z

Zang, Victor E. and Grott, Gerald J.		
pH Value of Molding Sands	June	116